

THE AUTOMOBILE

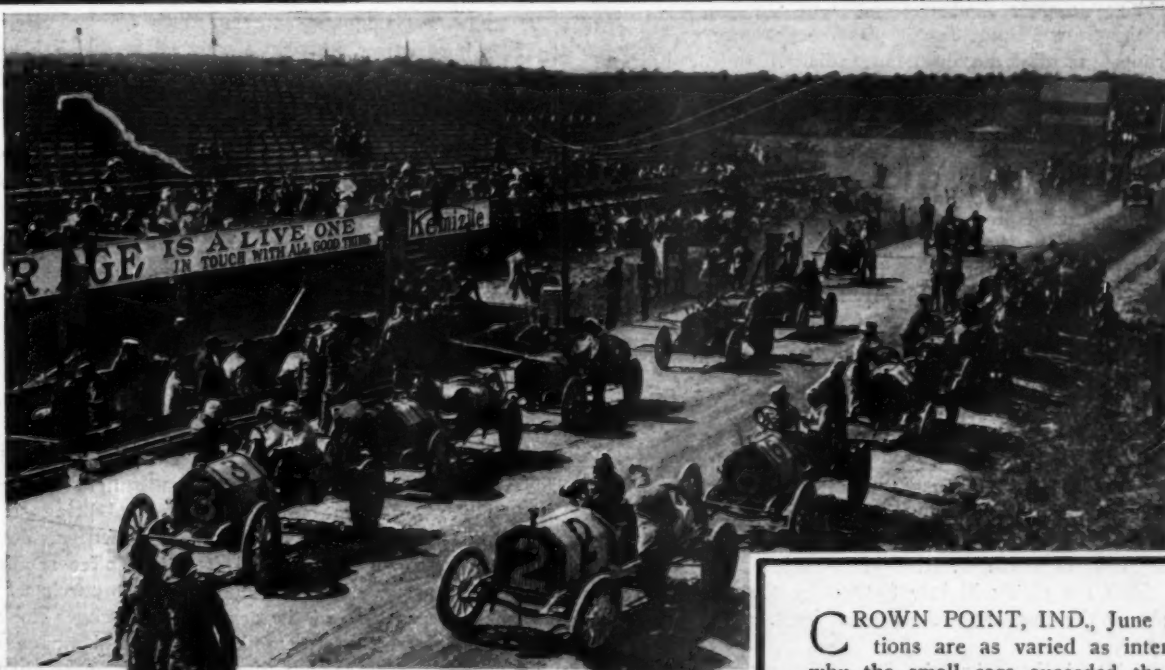
LITTLE CARS SHOW
MORE SPEED THAN
BIG ONES



IN
WESTERN
STOCK CHASSIS RACES

COBE CUP: LOUIS CHEVROLET, 30.4 H.P. BUICK, 49.3 M.P.H.

INDIANA TROPHY: MATSON, 25.6 H.P. CHALMERS-DETROIT, 51.5 M.P.H.



Eleventh Hour of Small Car Race

CROWN POINT, IND., June 19—Explanations are as varied as interesting as to why the small cars exceeded the big cars in speed ability in the "Western Stock Chassis Races." Friday, Matson with a 25.6-horsepower Chalmers-Detroit scored best among the small car contingent, which was asked to make ten

circuits of the 23.27-mile course, a total of 232.74 miles. The winner's average was 51.5 miles per hour.

To-day, Chevrolet successfully piloted a 30.4-horsepower Buick, with rare skill and perseverance, in the big car event wherein the contestants were required to travel 17 circuits, which gave a mileage of 395.65. But the greater distance killed off many, and the victor's sustained flight of speed only footed up 49.3 miles per hour. In the small car race, two besides the winner—Locomobile and Marion—exceeded the speed of the big car performer.

True, it was a bruising distance and the course had a serious handicap in a stretch of over a mile which couldn't be considered other than very bad. A dose of this in every circuit didn't help the cars, especially in the Cobe Cup race, and one after another suffered from disablements which sent them to the side of the road temporarily or permanently.

Mayhap in the effort to give the onlookers a plenteous run for their money, the distance was increased beyond the capacity of the cars for such a course. In like manner, the capacious grand stand offered accommodations for thousands who came not. 'Tis a weakness of Chicago folk to make things bigger than anyone else, and this was their first experience with a great automobile road race.

But let it be said right here, that the job was done prodigiously, and withal most excellently. No expense restrictions interfered with the work of the indefatigable committee, and its members labored from early until late, in order to have everything right up to the mark.

That poor stretch in the course had to be accepted as one of the regrettable handicaps, and if the enormous stand didn't hold the expected throng, it meant that the interest in automobile racing had been overestimated in the West. Even if the events had been "National" instead of "Western," it is a safe assertion that the crowds would not have been any larger, for it must be remembered that the West is always loyal to anything which is branded as of the West.

Credit in huge hunks belongs to that committee which contains the names of Trego, Beecroft, Van Sicklen, Edwards, Sinsabaugh, Ayers, Root and Wheeler. And here, too, should be mentioned the many who helped the grand scheme in minor capacities. The Chicago Automobile Club has good cause to feel proud of its "Western Stock Chassis Races," and to Ira M. Cobe, president, a special vote of thanks is forthcoming.

One of the hitherto unaccomplished things in connection with the racing on the Crown Point circuit was the presence of Illinois State troops guarding an event in Indiana. In the East anything of this sort would have been denounced as "unconstitutional" and impossible. The fact that the races supplied the greater competitive spectacle of modern times free of charge to thousands, wouldn't have had the slightest bearing in the premises. The matter in which the West brushes aside precedent and takes the initiative is invariably most refreshing. It frequently is made to appear that the laws are for the people who have the red blood to insist that their interpretation shall mean the greatest good to the greatest number.

PRESIDENT COBE ON FUTURE RACES

Before the big race for the Cobe cup had concluded there was some talk of next year, and in the course of an interview President Cobe said:

"We do not know whether we want to attempt another race on this scale next year. Perhaps the West does not care enough for such an exhibition. Possibly it is new and we must first show them that the show is worth while.

"I do not think the club will lose \$25,000 by the two races. We will not know the cost for two weeks at least. It will be a considerable loss.

"I am inclined to believe that those most benefited by such an event as a big road race should assist appreciably in paying the cost of running it."

MATSON TELLS HOW HE WON

"The only man I was afraid of was Strang," said Matson. "I made up my mind to catch up with him if I could and cling to him all the way around. I did not know that he was disabled on the third lap, but thought he was ahead of me all the time. I knew I had the speed in my car and that my principal task was to hold the light machine together by conservative driving. The race was the fairest that I ever saw.

"None sought unfair advantage of another. During the race I passed every car but the Marion, driven by Monson, and entered as No. 6. Robertson in his Locomobile and I passed each other repeatedly, and he tried to out-manuever me.

"On the long west stretch of the course I blew out a tire, but Vaughan and I replaced it in one minute and fifty seconds.

"My car responded instantly to the levers, and the way it gripped the road made it hard on the rear tires. In addition to the one I wore out, the one on the other rear wheel wore clear through to the fabric. I knew it was in danger of going and that a stop to put on a new one might lose me the race. As we pulled into Lowell on each lap we knew exactly how far we were ahead. The Chalmers-Detroit camp had a big bulletin board there and gave us the time on each lap. In addition to the time lost changing the tire, we lost one minute and fifty-eight seconds shipping gasoline and water.

"On the last lap I knew that we were more than eight minutes ahead and had plenty of time. So I kept a steady pace and took no chances. It was on this lap that Robertson tried to jockey me out of the race. He knew my tire was bad and he passed me and fell back to tease me into sprinting ahead of him. This I would not do, but let him have third place, not to risk unnecessarily the race I already had won."

CHEVROLET'S OPINION OF THE BIG RACE

After the race was over, and the excitement had subsided enough to permit of actual thought, Louis Chevrolet had the following to say about his victory: "I drove the last eight laps of the race on nerve—nothing else. When I lost the use of one cylinder as the result of the hard jumping over the rocks I almost wanted to give up. But something told me to stay in. It must have been the training I received while a mechanic for Hemery, the greatest motor racing driver the world has ever known. He never has been known to give up. He taught me to drive that way in all my contests.

"It was a hard drive, though. I weighed myself Friday when the officials were inspecting the cars, and honestly, I'm twelve pounds lighter to-night than I was before the start. Two such contests in rapid succession will tell on any man. I wanted to hang up a road record, but the course was in dangerous shape. I can only say I am indeed happy, for hard luck followed my partners, Strang and Burman, all through the two races here."

Ante-Race Stories Scared Away the Crowds—Accounts of the great crowd that was expected, the high prices that would be charged for food and shelter, and the probability that visitors might go hungry, are thought to have kept many from the scene of action. There were vivid tales of how automobile-race goers might have to fight for something to eat and how they would be jostled about, so that officials have concluded that many stayed at home for that very reason. After it was all over, it was realized that the prices were no higher than might be expected, perhaps double, the charge for a 25 cent meal being 50 cents. There was no great dearth of food, and the crowd was not in an "ugly" mood, as some perhaps had feared. Coffee retailed for five or 10 cents a cup, depending upon how the purchaser asked for it and the appearance of the asker. Under cover the charge was a dime, but on the streets the same liquid was a nickel. Sleeping quarters were seldom, if ever, sold at more than \$3 a room, and those at \$10 were the unfortunate dreams of over-zealous press agents.



Chevrolet, the Winner, and Nelson, the Mechanic Who Helped

CROWN POINT, IND., June 19—Chevrolet in his contest for the Cobe trophy had to contend against four successive adversaries who confronted him at one time or another during the seventeen laps of the big race. Of these four (Burman, Denison, Robertson and Bourque) two (Burman and Denison) fell by the wayside before the race was one-third over, but the other two (Bourque and Robertson) contended to the finish. In the first two laps his team-mate Burman was his rival, Burman leading Chevrolet five seconds in the first lap, and fifteen seconds in the second. At this juncture, Denison with his Knox came to the fore, and not only took the lead away from Burman but placed himself also 42 seconds in advance of Chevrolet. In lap three Denison piloted the Knox around the circuit in 22:34, establishing the time record for the course. Lap four found Chevrolet to the front for the first time, having the advantage of but 12 seconds over Denison and 57 seconds over Burman. But his lead was short lived, as Denison, who had tire troubles, was destined to put the Knox to the front on the fifth lap in what proved to be the second fastest of the day, 23:08. Denison relinquished his hold, however, in lap six, due to tire troubles, he having to stop 2 minutes 10 seconds at the end of this lap to take on a tire and oil, and having lost more time during the lap changing a tire. This permitted Chevrolet to lead at the end of lap six with a margin of 2 minutes 22 seconds. Burman retired during this lap owing to gasoline troubles and went out of the race. No sooner had he ceased as a factor than both Robertson in his No. 9 Locomobile and Bourque in the No. 2 Knox entered into the first place conflict. Chevrolet had a lead of almost four minutes on Robertson and five minutes on Bourque, in the seventh lap, at which time Denison had gone out of the race owing to a breaking of a connecting rod. Denison stated previous to the start of the contest that his engine had been run for almost two years without the cylinders being taken off, and he had asked for a new engine before the start of the race.

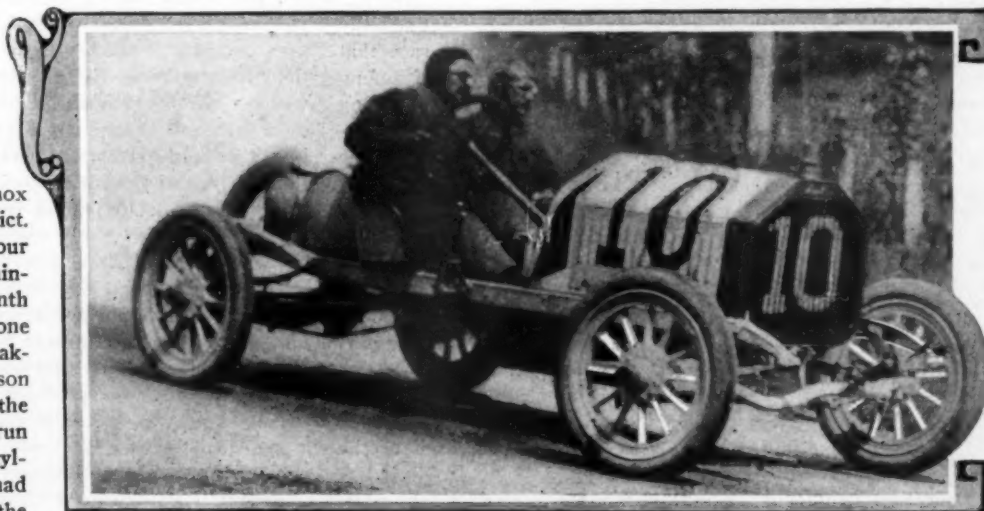
With the fight in lap eight a three-cornered one involving Chevrolet, Robertson, and Bourque, the Frenchman gained an advantage on the seventh lap and finished 6 minutes 30 seconds to the good in the eighth. He was now leading Bourque's Knox by over 18 minutes, Bourque having stopped 7½ minutes in this lap at the grand stand to change tires and take on gasoline, oil, and water. But Chevrolet's pace was being rapidly eaten into by Bourque and Robertson. In lap nine Robertson cut the lead practically 2 minutes and Bourque lost but 6 seconds to Chevrolet.

It remained for lap ten to be Chevrolet's Waterloo, he requiring 44 minutes 1 second to make the circuit, while Robertson romped around in 24:57 and Knox in 27:17. This was the lap when Chevrolet had valve troubles. At the grand stand at the completion of the lap he changed two rear tires, took on gasoline, and some extra valves. The delay allowed Robertson to take the lead at the end of lap ten by a clear margin of 12 minutes 32 seconds.

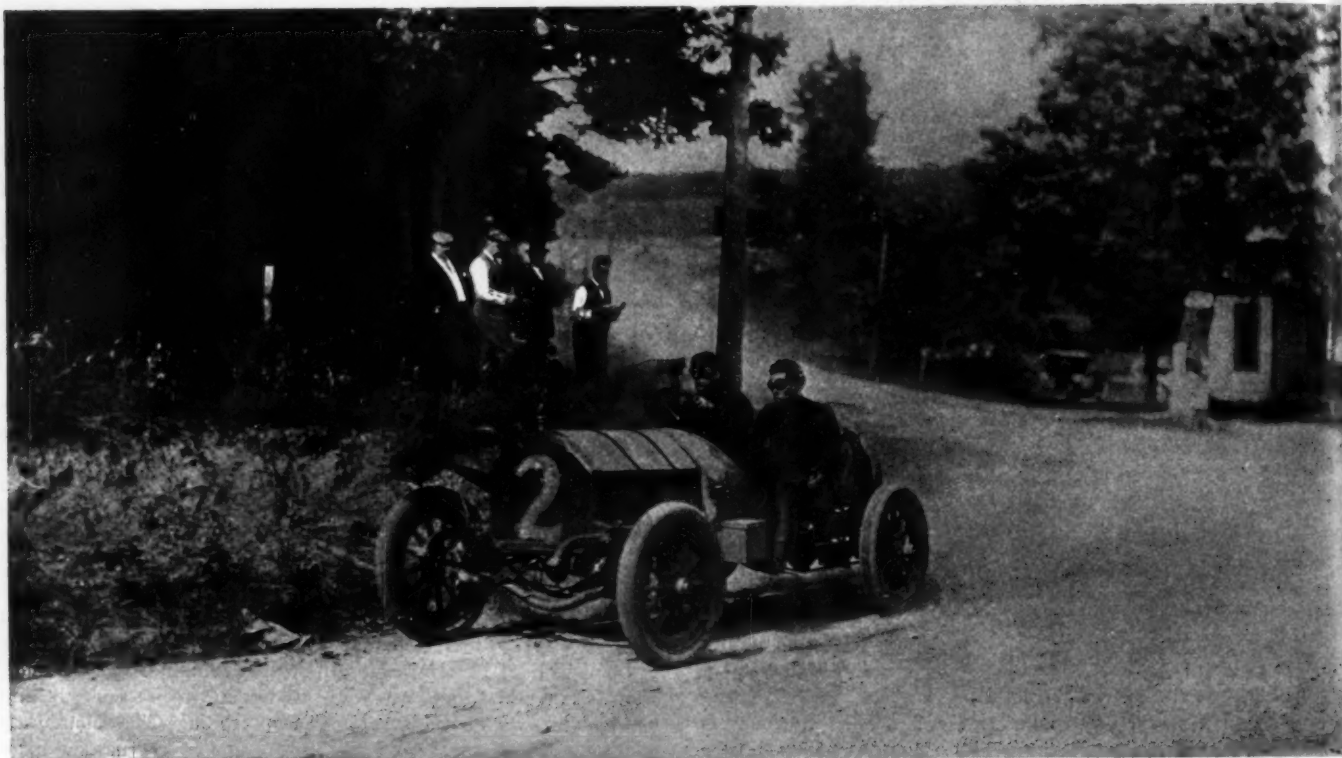
Bourque at this time was only 1 minute 15 seconds behind Chevrolet. Lap eleven saw Robertson leading Chevrolet by 27 minutes 7 seconds, and Bourque leading him by the narrow margin of an even 10 minutes.

In lap twelve this order of Robertson-Bourque-Chevrolet remained, Robertson having dropped his lead to 19 minutes 14 seconds owing to a stop at Lowell. At the end of this lap he stopped at the grand stand for 4 minutes 40 seconds to take on supplies and change rear tires. This delay accounts for his losing 6 minutes to the Frenchman.

If lap ten was Chevrolet's hoodoo, lap thirteen proved the undoing of both Robertson and Bourque. Robertson had a 6 minutes stop during the lap at Lowell because of ignition troubles, and when he reached the grand stand at the completion of this lap 13 minutes were needed to change the magneto and do some other adjusting. Part of this proved fruitless, as a test of the magneto immediately after it was off showed it was in perfect working condition. While Robertson was working over his difficulties, Bourque was aware of his. During this lap Bourque had filled with water and failed to close the petcock at the base of the radiator, so that when he reached the grandstand not a drop of water remained in the radiator or jackets. It was taking too great a chance to pour cold water into the jackets, and by



Chevrolet (Bulck) Took Corners Skillfully But Cautiously



Bourque (Knox) Once Appeared a Certain Winner, and Supplied the Gamest Kind of Fight to Finish

actual stopwatch he consumed 12 minutes 40 seconds for gasoline, water, and oil and getting started. These extraordinary delays proved the undoing of Robertson, who dropped from first place to third, and Bourque took the lead by slightly over a 6 minute margin from Chevrolet.

Chevrolet, starting with lap fourteen, had settled down in the run for the finish, having enough tires and sufficient gasoline and oil to carry him over the finishing line. He held the lead throughout the remaining four laps, although Bourque was gradually reducing it. In lap fourteen he led Bourque's Knox by 2 minutes 54 seconds. In the fifteenth lap Bourque cut 40 seconds off of this. In the sixteenth lap he reduced it 53 seconds more, and in the seventeenth lap he cut 16 seconds off. But it was not sufficient to win, as it left the Frenchman a final margin of 1 minute 5 seconds, with Robertson 12 minutes in the rear.

While Chevrolet, Bourque, and Robertson were fighting out the first positions, an interesting struggle was taking place between Hearne in No. 11 Fiat and Englebeck in No. 5 Stoddard-Dayton, the former finally winning out.

Although the real struggle was among the five cars that actually finished the contest, there were other factors in the race that kept matters at fever heat until they dropped out. Chief among these was Miller's No. 1 Stoddard-Dayton, which was a strong factor up to the fourteenth lap, when it was eliminated by shearing four pins in the universal joint in the propeller shaft. The report was circulated that the car was in a ditch with two rear wheels off, which proved false, as Miller brought the car to the grandstand before the finish of the race, having taken two pins out of the other universal joint to repair the broken one. His third lap was one of the fast laps of the day, being made in 24:11.

Strang, who was looked to as a possibility, never proved dangerous. In lap one he stopped to take on a supply of valve pins which had been giving trouble, and in lap five was stopped for 1 hour 10 minutes in front of the grandstand while the mechanic effected some valve repairs. After this he made attempts at the lap record, but failing to get closer than 1:23 seconds of the mark set by Denison's Knox in lap three.

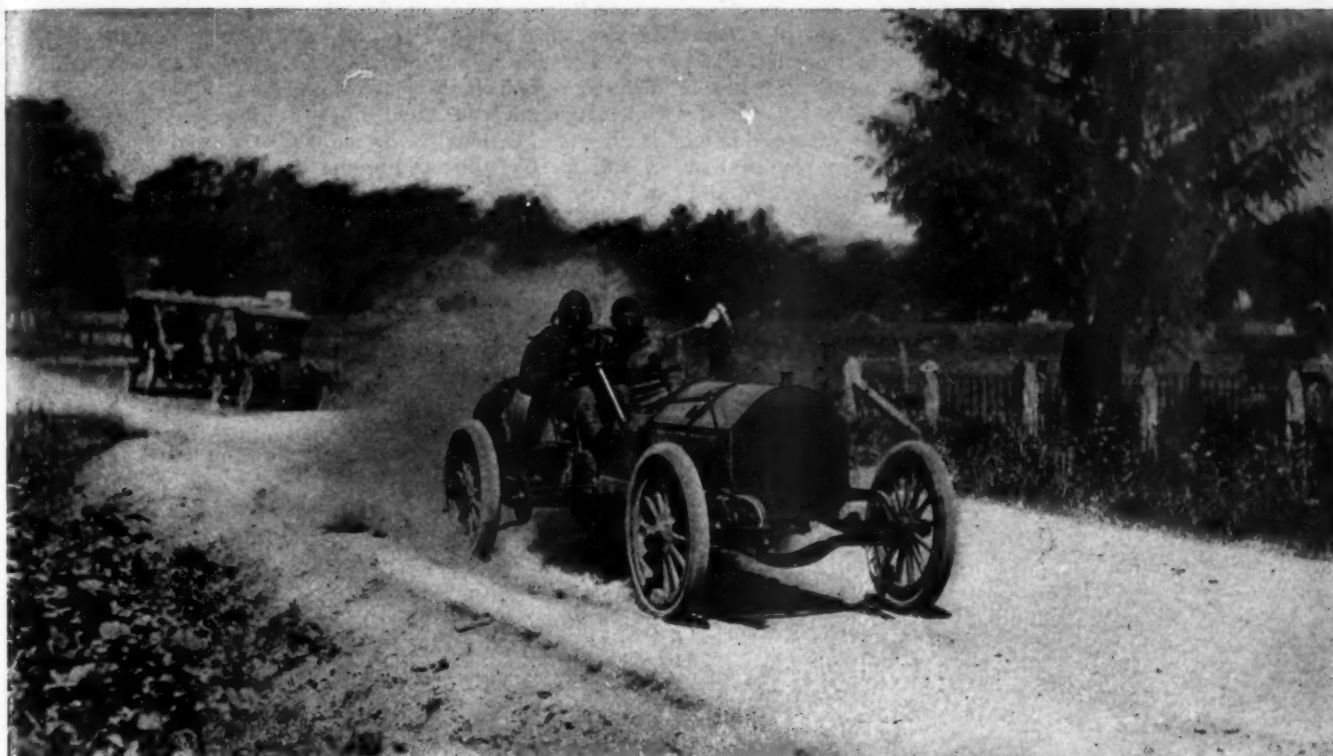
First Lap—Following their tactics in the Indiana trophy race, the Buickers again started to burn up the road in the Cobe cup and the result again showed that the Buicks had made the best

time for the initial lap, Burman, last to start, having negotiated the circuit in 24:15, which was 34 seconds slower than Burman himself had done in the curtain-raiser. The first one past the grand stand in this lap was Bourque in the Knox, who had caught and passed Miller in the Stoddard on the west leg. Chevrolet, even thus early showed he was not to be overlooked, for in point of time he was second to his team mate. Bourque was in third place, while Denison was just warming up in fourth. Seymour was the first to experience trouble on this lap. At the very first turn he slapped on his brakes, which, however, were covered with oil. So terrific was the pace at which Seymour was going that he skidded completely around on the road and tore off two tires. Finishing this lap, Strang was the first to go to the pits, a pin on a rocker arm having been lost. Burman's pace may well be imagined when it is known that he was timed over the special mile stretch at 87.6 miles per hour.

Second Lap—Bourque still continued to hold his place at the head of the procession, finishing the second lap, although he was not the actual leader. Burman still had that honor, his second lap being even faster than his first. Chevrolet, too, was putting up a good battle against Father Time and was runner-up. While the racers were going on this lap the report came that Florida was out of the race without even finishing one round, a sleeve on a camshaft breaking and ending his career just after turning into the home stretch. Denison was becoming a factor even thus early, and the running of the Knox made it a favorite.

Third Lap—This round furnished a big sensation and made Denison and the Knox even greater favorites, for the time showed a record had been broken, Denison having negotiated the circuit in 22:34, the fastest time ever recorded for the circuit and equal to 62 miles an hour. This terrific pace carried him to the front. Burman had slipped back to third and his team mate, Chevrolet, still hung to second place, being 42 seconds back of Denison. Bourque in the other Knox hung onto the lead and was in fourth place, while Robertson was "jogging along" fifth. There was only 3 minutes 21 seconds between first and fourth, so it was becoming a real race.

Fourth Lap—Denison slowed a bit the fourth round, while Chevrolet, continuing his even pace, went to the front, having the lead by 12 seconds. Burman was holding third, while



Robertson (Locomobile) Rounding Cemetery Turn Without Any Apparent Thought of the Hereafter

Bourque was fourth. Seymour had enough on this round, a broken connecting rod stopping him near Cedar Lake. It seemed at this stage as if the contestants had settled down to a steady grind, realizing that a 400-mile race was far from being a sprint.

Fifth Lap—Denison got his second wind in this round. He went out after Chevrolet and got him, his round in 23:08 being the second fastest on record. Chevrolet was only 5 seconds slower than on his fourth round, but Denison picked up enough to make him the leader of the race by 1 minute and 19 seconds. The way he was going it looked as if he would maintain the lead to the end. Still, the first five were remarkably close, there being only some 3 minutes separating first and fifth. Hearne in the Fiat was plugging along consistently, evidently having laid out a schedule and being determined to hold to it.

Sixth Lap—Chevrolet came into his own on this lap, closing up on Denison and being better than 2 minutes to the good of the Easterner who had again slowed after a fast round. Chevrolet had done his lap in 25:47, his slowest so far, while Denison had dropped back to 29:28. Burman had engine trouble and quit after having been in third place; this, of course, moved Bourque up a peg. Robertson in the Loco was holding his own, while Hearne was showing regularity and precision of running.

Seventh Lap—Denison went down and out on this round, a connecting rod breaking and the front end of his car catching fire. This removed a most formidable rival from Chevrolet's path and he was glad of it, for his pace was slowing as was that of the others. Robertson profited and climbed to second, becoming at once a favorite with the people, who declared the Vanderbilt winner was just about to make his run to the front. It looked that way at least, although on this round Chevrolet had the fastest time. Robertson was more than 4 minutes back of the flying French leader.

Eighth Lap—The Frenchman again clipped off the fastest lap in this round, doing 25:50, while Robertson slowed, although holding second place. Bourque was still third, while Miller was fourth. Englebeck was holding fifth, with Hearne sixth. Lytle, in seventh place, was having trouble with his magneto and a broken spring, but still was on the move.

Ninth Lap—Again it was Chevrolet who held the time honors when this round was completed and it was with Robertson

grimly hanging on. At this stage the Locomobile driver gave evidence that he was not to be overlooked and that he was far from being beaten. His was the fastest round, the watches giving him 25:38. Chevrolet had dropped to 27:14, his slowest of the race, and there was a difference of but 5 minutes between the two. Bourque hung to third and in fourth place was Miller in the No. 1 Stoddard, who was just ahead of his running mate, Englebeck. Hearne was sixth and the last man with a chance to win.

Tenth Lap—This round nearly saw the end of Chevrolet, for it was on this lap that he had his engine trouble, a valve breaking and getting into a cylinder and punching a hole in the piston. But the Frenchman was not discouraged. He patched it up as best he could and continued on three cylinders. This gave Robertson his chance and the Locomobile shot to the front by virtue of a lap in 26:35 to 44:01 for Chevrolet, and led by 13 minutes and better. Bourque was still third and Miller fourth.

Eleventh Lap—Lytle withdrew at this stage of the race, leaving only seven cars, of which number the Strang-Buick was practically out. Robertson continued making his fight for the cup and it began to look very dubious for Chevrolet. Robertson cut out 24:57, it being the third consecutive time he had made the fastest round, and he had Chevrolet by 16 minutes. It seemed all over but the shouting, but Chevrolet limped along grimly on those three cylinders, determined to finish at any rate. His trouble had relegated him to third and Bourque found himself in the position of runner-up. Miller was fourth and Hearne fifth.

Twelfth Lap—Robertson began to have trouble at this stage of the race. He was held up 6 minutes at Lowell and while he was first when the tape was crossed his lap was a slow one—36:20. Still, he was 20 minutes ahead of Chevrolet, who had dropped to third place, while Bourque had gone to second. All the cars were slow on this lap, the 26:13 of Bourque being easily the fastest.

Thirteenth Lap—A new leader developed this time around, Bourque going to the front for the first time in the race. He had an advantage of 7 minutes over Chevrolet, both of them having caught and passed Robertson. The Locomobile man thought his magneto was giving trouble and he released his grip on the

COBE CUP RACE, THE WEST'S FIRST VANDERBILT, JUNE 19, 1909—DISTANCE, 395.65 MILES; CIRCUIT, 23.27 MILES

No.	Car	Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
10	Buick	Chevrolet	23:27 M	46:54 M	69:82 M	93:09 M	116:37 M	139:64 M	162:91 M	186:19 M	209:46 M	232:74 M	256:14 M	279:28 M	302:56 M	325:83 M	349:11 M	372:38 M	395:65 M
2	Knox	Bourque	0:48:32	0:48:32	1:12:43	1:37:00	2:01:39	2:27:26	2:53:05	3:18:55	3:46:09	4:30:10	5:08:42	5:38:09	6:07:36	6:36:12	7:04:50	7:33:38	8:01:39
9	Locomobile	Robertson	0:49:27	0:49:27	1:14:39	1:40:09	2:05:45	2:31:32	2:58:49	3:37:10	4:04:30	4:31:25	4:58:42	5:26:55	5:55:07	6:23:25	6:51:40	7:19:53	7:48:06
11	Fiat	Hearne	0:50:03	0:50:03	1:15:24	1:41:15	2:06:26	2:31:40	2:57:50	3:25:25	3:51:03	4:17:38	4:42:35	5:18:55	5:45:58	6:11:53	6:37:50	7:03:47	7:29:44
5	Stoddard-Dayton	Englebeck	0:54:56	0:54:56	1:22:08	1:50:26	2:18:28	2:52:19	3:20:24	3:51:00	4:24:38	4:53:31	5:22:21	5:50:58	6:22:23	6:53:45	7:24:49	7:55:53	8:26:05
1	Stoddard-Dayton	Miller	0:51:45	0:51:45	1:18:25	1:49:57	2:15:48	2:44:24	3:10:15	3:44:51	4:16:05	4:56:05	5:25:14	5:54:44	6:23:45	6:52:25	7:21:05	7:49:45	8:18:25
4	Buick	Strang	0:57:11	0:57:11	1:21:22	1:47:14	2:12:33	2:43:37	3:13:26	3:42:19	4:11:59	4:40:40	5:15:15	5:46:34	6:23:45	6:52:25	7:21:05	7:49:45	8:18:25
8	Apperson	Lytle	1:01:46	1:01:46	1:35:36	2:10:09	2:40:07	3:09:58	3:39:04	4:08:01	4:36:51	5:05:44	5:34:37	6:03:30	6:32:23	7:01:16	7:30:09	7:59:02	8:27:55
7	Knox	Denison	0:51:15	0:51:15	1:25:37	1:57:43	2:24:42	2:52:39	3:19:49	3:46:58	4:14:07	4:41:16	5:08:25	5:35:34	6:02:43	6:29:52	6:57:01	7:24:10	7:51:19
12	Buick	Burman	0:49:27	0:49:27	1:12:01	1:37:12	2:00:20	2:29:48	2:59:01	3:28:10	3:57:19	4:26:28	4:55:37	5:24:46	5:53:55	6:23:04	6:52:13	7:21:22	7:50:31
3	Apperson	Seymour	0:48:17	0:48:17	1:13:07	1:37:57	2:02:51	2:27:45	2:52:39	3:17:33	3:42:27	4:07:21	4:32:15	4:57:09	5:22:03	5:46:57	6:11:51	6:36:45	7:01:39
6	Locomobile	Florida	1:03:28	1:03:28	1:28:13	1:57:17	2:26:11	2:55:05	3:23:59	3:52:53	4:21:47	4:50:41	5:19:35	5:48:29	6:17:23	6:46:17	7:15:11	7:44:05	8:12:59

Ditched on first lap; out.



Englebeck (Stoddard-Dayton) Takes on Supplies

SPEED OF LEADERS IN COBE CUP RACE

Car	Driver	Miles	Time	M.P.H.
Buick	Chevrolet	395.65	8:01:39	49.3
Knox	Bourque	395.65	8:02:44	49.2
Locomobile	Robertson	395.65	8:14:30	48.0
Fiat	Hearne	395.65	8:22:04	47.2
Stoddard-Dayton	Englebeck	395.65	8:26:05	46.9

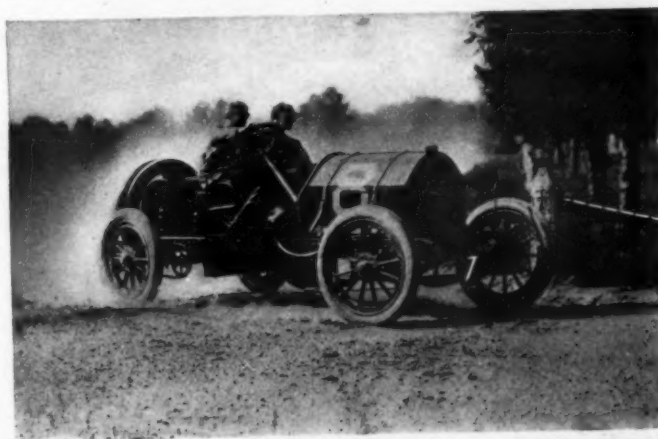
REGULARITY OF RUNNING IN COBE CUP RACE

Car	Driver	Fastest	Slowest	Variation
Fiat	Hearne	27:03	37:22	10:19
Knox	Bourque	24:41	38:21	13:20
Stoddard-Dayton	Englebeck	24:19	40:00	15:41
Buick	Chevrolet	24:11	44:01	19:50
Locomobile	Robertson	24:57	52:58	28:01

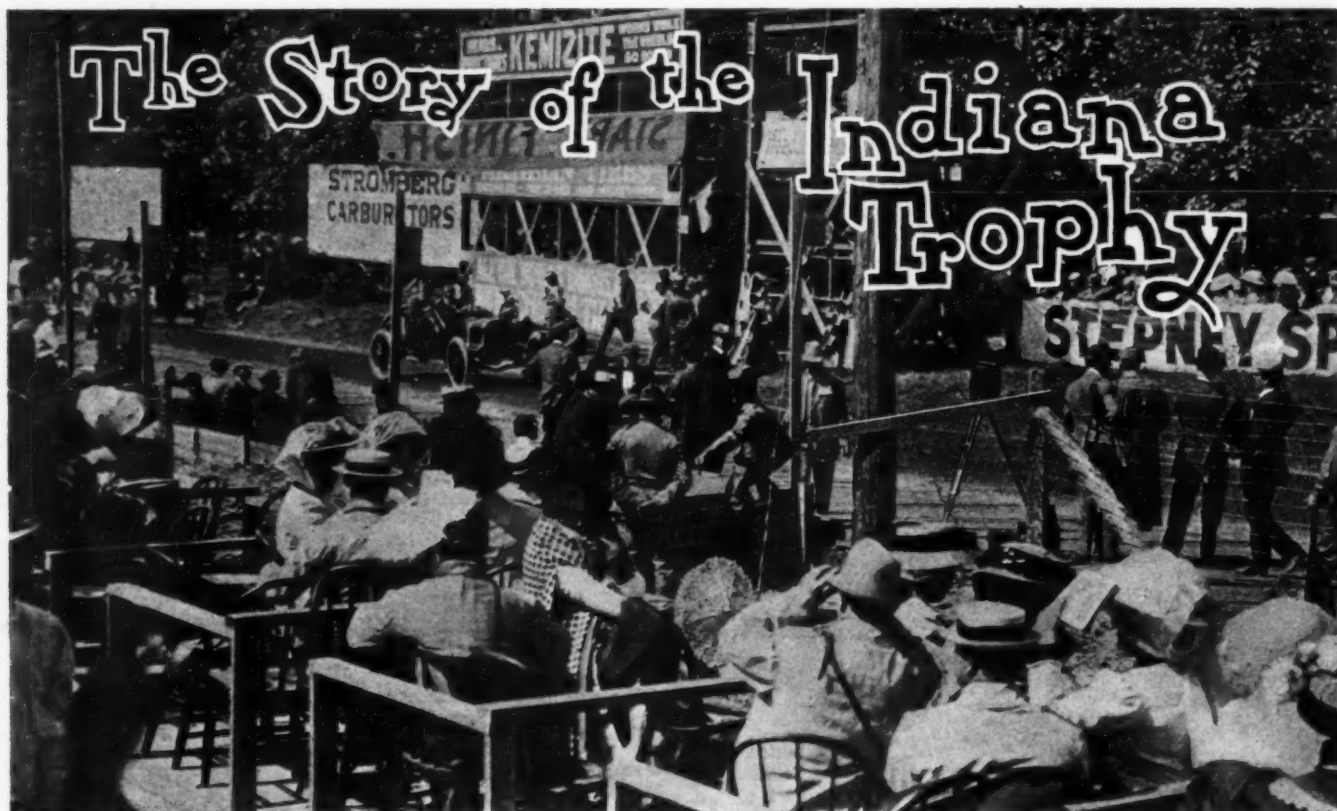
FASTEST LAPS OF CARS IN COBE CUP RACE

Car	Driver	Lap	Time	M.P.H.
Knox	Denison	3rd	22:34	61.9
Buick	Strang	6th	23:57	58.3
Buick	Burman	2nd	24:02	58.1
Stoddard-Dayton	Miller	3rd	24:11	57.9
Buick	Chevrolet	3rd	24:11	57.9
Stoddard-Dayton	Englebeck	2nd	24:19	57.45
Knox	Bourque	1st	24:41	56.7
Apperson	Seymour	3rd	24:45	56.6
Locomobile	Robertson	11th	24:57	56.0
Apperson	Lytle	1st	25:33	54.7
Fiat	Hearne	2nd	27:03	51.7

Note—A number of facts not brought out by the four tables given on this page and the one on the opposite page are of interest. Thus, Denison, who had such hard luck, after making a determined bid for the lead, not only heads the list of fast laps, but made the second best also. This was on the fifth lap, when rising from second to first position, he did 23:08. Following this a slow one in 29:28 put him back into second place. The remarkable regularity of running of the two Locomobiles in the Indiana did not have any counterpart in the Cobe. In the former race, no one of Robertson's first five laps varied more than ten seconds from 28 minutes for the circuit. At the same time, Florida was reeling; them off close to 29:30, no one of his first seven being farther away from that mark than 30 seconds.



Lytle Taking His Apperson Around Graveyard Turn



Small Cars Lining Up for the Indiana Trophy Event on the First Day

CROWN POINT, IND., June 18—That the 232.74-mile road race held to-day for the Indiana trophy will go down in history as one of the greatest small-car races in America is beyond doubt. Of the sixteen starters, nine were running at the finish, and six completed the ten laps, thereby setting the record for the greatest number of finishers in any American road race. The cars were all tuned to the minute, which is borne out by the consistent running of many of them. The winning Chalmers team had been on the course early, and the little cars had been doing consistent work in the daily practicing. A surprising feature of the race was the speed the little cars made and the reliability they showed. After the first two or three laps, many predicted they would soon stop, but these "Doubting Thomases" were more surprised to find them running with the same regularity at the end of the 232 miles. The speed of Matson's winning Chalmers was greater than had been anticipated, and, as after events proved, it maintained a higher average for its ten laps than did the winner of the Cobe trophy for the seventeen laps of the following day.

According to his own words, Joseph Matson, driver of No. 19, winning Chalmers-Detroit, was not certain as to his status in the race until the fifth lap, when he had sufficient lead to give reasonable assurance of winning with consistent running. Matson started out slowly, requiring 29 seconds for the first lap, which put him in eleventh place, Strang and Burman, in Buicks, setting the fastest times. Strang was eliminated in lap two by breaking an axle, and Matson, by driving the lap in 25:43, was able to climb from eleventh to third place, leaving Burman in first place with 5 minutes' margin, and Poole, his running mate, in another Chalmers, 67 seconds ahead of him.

Lap three was the one that gave first evidence of Matson's work, and when he finished this lap and had landed in first place, overtaking ten competitors in two laps, it was good evidence of what might be expected at the finish. As it was, he got the lead and held it tenaciously to the end with the exception of lap four, when Knipper, his running mate, wrested it from him by 2 seconds. Unfortunately Knipper cracked a cylinder in the fifth lap and the promised fight between Matson and himself vanished.

Laps three and four were essentially Chalmers-Detroit laps in that Matson, Poole, and Knipper, driving the Chalmers team, were the three leaders. In lap three the times were: Matson, 1:20:24; Poole, 1:20:28; Knipper, 1:20:47. But 25 seconds separated the three, and in lap four this triangular home fight continued, with Knipper, 1:46:27; Matson, 1:46:29, and Poole, 1:46:54.

In lap three Chevrolet, Robertson, Wells in a Moon, and Wiseman in a Stoddard-Dayton, were trailing the Chalmers trio closely, but in lap four, Chevrolet was out because of valve troubles, leaving Monsen in the Marion, Robertson in the Locomobile, and Wells in the Moon, close rivals. Lap five saw Matson back in first position, his running mate, Poole, two minutes later, a five-minute margin separating Monsen in third place, and a seven-minutes safety gap between him and the Locomobile. This was the first period in the race when the leader had a minute or more leeway, and gave him an opportunity to plan a complete run. This order of Matson leading with Monsen-Marion and Robertson's Locomobile in close pursuit continued through laps seven, eight and nine, and in the final lap Robertson moved up into second place, leaving Monsen in third.

While the struggle among these three for three first positions was engrossing attention, an interesting contest was taking place among Florida's Locomobile, Wells in the Moon, and Wiseman driving a Stoddard-Dayton. In lap seven Wiseman's time was 204 minutes 3 seconds, Wells' time 204 minutes 26 seconds, and Florida's 205 minutes 22 seconds. Lap eight saw Wells take the lead of the trio with Florida next, and Wiseman third. In lap nine Florida had taken what proved to be fourth honors away from the Moon, which was running but 43 seconds behind it, and the Stoddard was nearly a minute later. This order changed in the final lap, Florida still holding to fourth position, but Wiseman moving the Stoddard up into fifth, and the Moon finishing in sixth scarcely 3 minutes later.

Viewed from the grand stand, the race was entirely bereft of pit incidents, not a single car having to change tires at the pit during the run. Wiseman in the Stoddard-Dayton stopped in the third lap to take on oil, requiring exactly 1 minute and 25 seconds. Robertson halted his Locomobile exactly 50 seconds in the

fifth lap to replenish with oil and gasoline, and in this lap the Moon, No. 11, took on oil. A bad leak in the oil tank was discovered and 3 minutes and 45 seconds consumed in filling the tank and trying to repair the leak. Matson made four stops during the run. In lap one, he changed a tire due to a blow-out about 5 miles from the start. In lap four another blow-out occurred, and in lap seven he stopped at the grand stand for gasoline and oil.

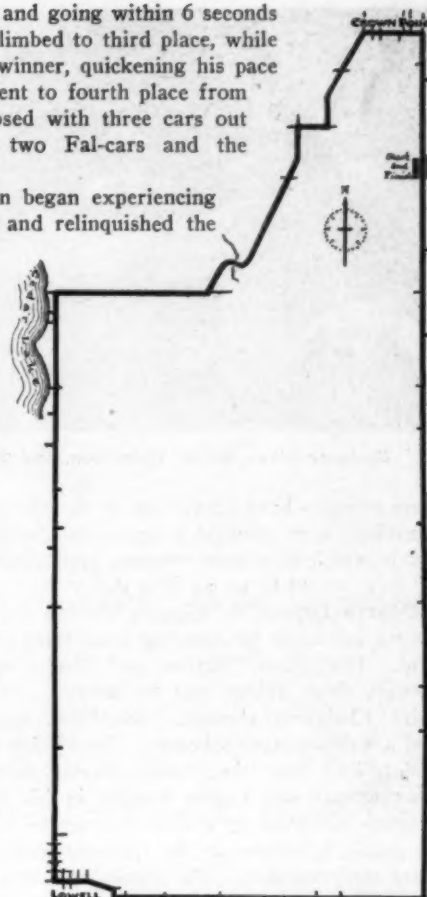
First Lap—Evidently the Buick team had received instructions to "beat it" from the start, for both Burman and Strang wasted no time in getting under way, Burman, in particular, clipping out a pace for the first lap that was faster than anything that had been shown in practice by the little cars. He soon caught Maisenville in the Corbin, who had started first. This left Burman out in front and the Buicker improved the opportunity afforded by the clear course to whiz around the circuit in 23:41. Strang, his team mate, showed 24:32 2-5, having caught Robertson and crossing the tape with Pearce in the Fal-car. Even at this early stage, though, the Chalmers-Detroit got into the running and it was Knipper in No. 5 who was third in point of time, his lap figures being 25:55. Maisenville was in fourth place and Pearce in the Fal-car fifth. The only absentee on this circuit was Ruehl in the Fal-car, who, however, managed to make the lap several hours later, crossing the tape for the first and only time after seven laps of the race had been run. It was apparent that the ones who later became the most important factors in the fight for the trophy were in no hurry at the start, for Matson was tenth in point of time, his first lap being his slowest. Robertson, too, "jogged" around the first time, being eighth, while Monsen was just ahead of him.

Second Lap—This terrific pace began to tell in the second round. Strang and Burman continued their helter-skelter clip and the former got his quietus at the cemetery turn at Lowell, where he stripped a pinion on his rear axle and took the count. Burman, however, managed to hold the lead he had gained in the first lap, but his time for the second circuit was considerably slower by nearly 3 minutes. With Strang eliminated, Wiseman in the Stoddard became second. His two laps were remarkably consistent, the first being 27:58 and the second 27:36.

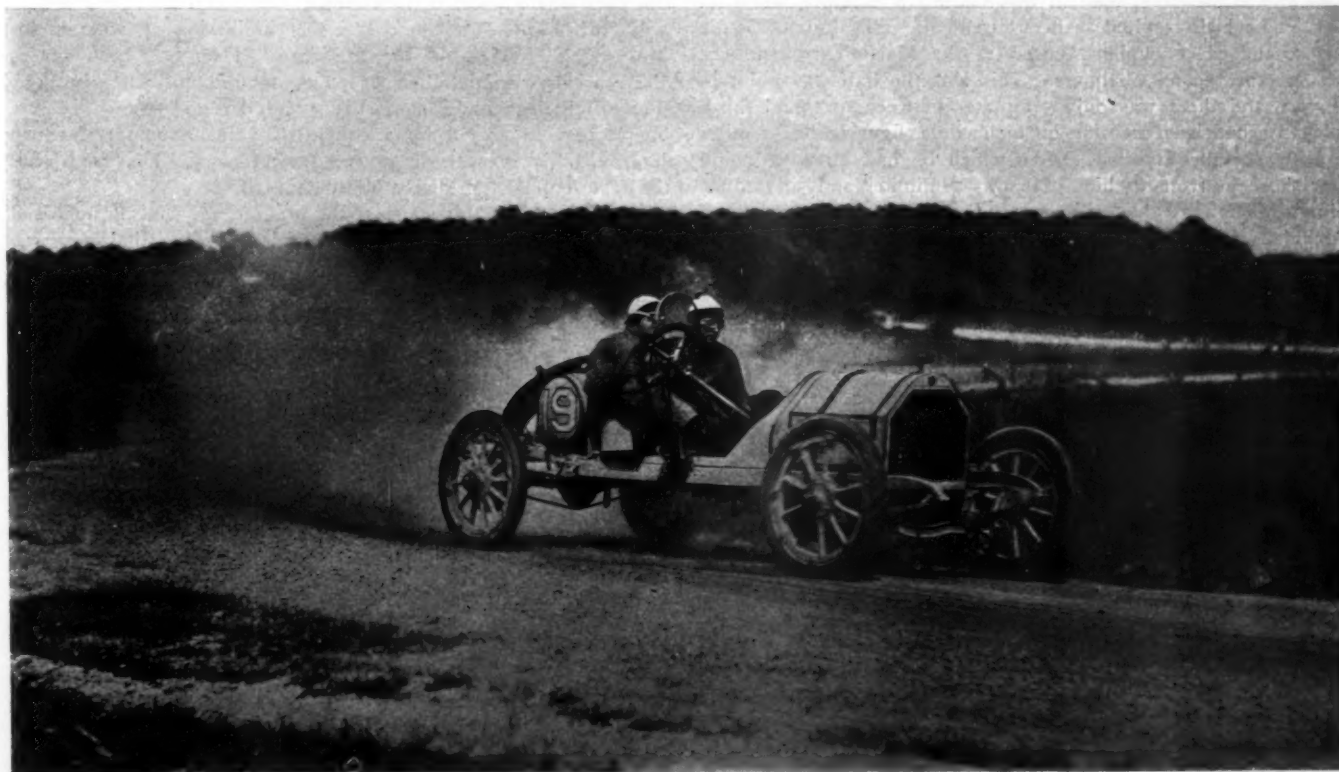
Poole, running evenly and going within 6 seconds of his first lap time, climbed to third place, while Matson, the ultimate winner, quickening his pace by some 4 minutes, went to fourth place from tenth. The round closed with three cars out of the running—the two Fal-cars and the Strang Buick.

Third Lap—Burman began experiencing trouble in this round and relinquished the lead he had gained the first two laps. He sifted back in the rapidly moving field and was ninth when he crossed the tape. At this stage the Chalmers colors came to the front and the finish of the lap saw all three Bluebirds flying out in front, Matson leading, with Poole second, and Knipper third. Chevrolet showed his first and only flash on this lap when he worked up into fourth place, nearly a minute back of Knipper. The race had settled down to a grind and the sprinters evidently had given up all idea of running the

legs off the others. The Chalmers drivers were running on a well-arranged schedule and it looked even at this stage as if they



Map of the Course



Matson and His Chalmers-Detroit "Bluebird" Rounding the Much-Talked-of "S" Turn

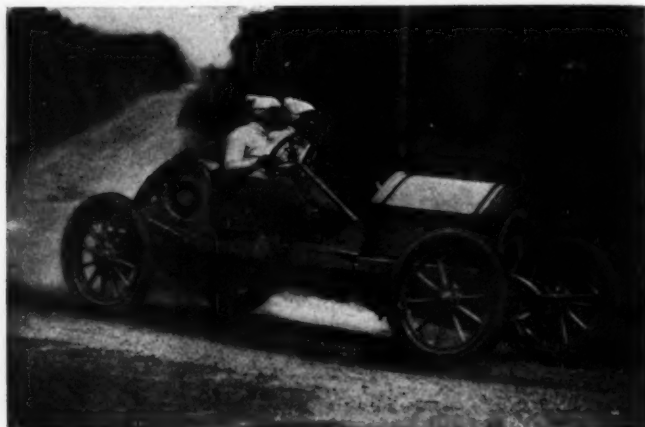


Designer Riker, Driver Robertson, and the Big Locomobile

were going to have a lot to say at the end of the race. The three Bluebirds were identical in appearance, and judging by the manner in which they were running, predictions were made that two of them would be in the first three.

Fourth Lap—Billy Knipper showed his nose in front in the fourth lap when he came up from third place and assumed the lead. His mates, Matson and Poole, were right with him, though, there being only 27 seconds separating the first and third Chalmers, showing remarkable consistency of running and a well-arranged schedule. On this lap Chevrolet had enough and retired from the contest, leaving an even dozen cars still running. It was engine trouble in his case. Monsen in the Marion had crept up a place through the retirement of Chevrolet, while Robertson in the Locomobile and Wells in the Moon were traveling well. The whole field was well bunched at this stage of the proceedings, all of the first six cars being inside a 6-minute blanket.

Fifth Lap—It was only a temporary eclipse for Matson when Knipper passed him in the fourth lap, for at the finish of the fifth Matson again was clipping out the pace and he never was ousted from the lead from this point on. The Chalmers suffered the loss of one man in this lap when Knipper broke an oiler lead which resulted in his retirement. This jumped Poole into second place, while Monsen in the Marion stuck to the heels of the second Chalmers. This was the half-way point in the race and there was only 5 minutes between first and third. Robertson had been running on a schedule, figuring on 51 miles an hour for the first half, after which he had intended going after those in front of him. He was 7 minutes and 30 seconds behind Matson at the half-way mark and those in the stand concluded that Robertson had his work cut out for him, so well was the Chalmers running. Ten cars were left in the fight at this point, but of these ten, only eight had any kind of a



Monsen and the Consistent Marion, Which Finished Third

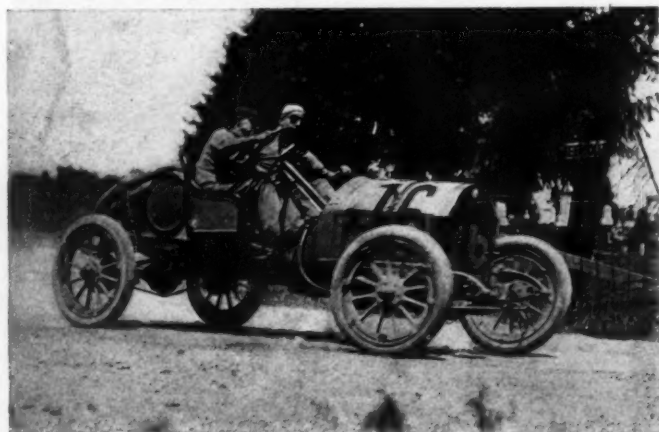
chance. Maisonville in the Corbin and Wright in the Stoddard being so far back they were not given any kind of consideration. Burman dropped in this round, disqualifying himself when he borrowed a valve from Strang's car which he found deserted on the cemetery turn at Lowell. Burman made the change, picked up Strang and drove to the finish, where he ran his car off the course and retired from the race.

Sixth Lap—Poole was sifted back into the rear in this round, dropping from second to eighth. Matson still kept his lead, being closely pursued by Monsen, who was the dark horse of the race. Monsen, however, was 7 minutes back of the leader and was in danger of being caught by Robertson, who at this time began to show an inclination to get to the front. Wells in the Moon had been sticking to Robertson like glue and at this stage it looked to be a fight for second place in which Monsen, Robertson and Wells were the interested parties.

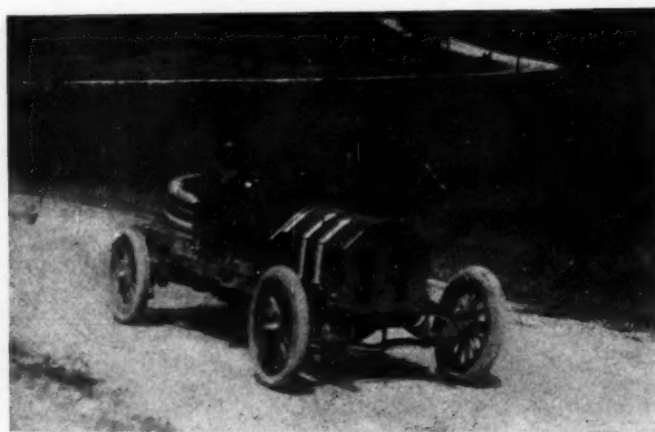
Seventh Lap—Matson still had the speed of the party and his seventh lap was the fastest of the lot; Monsen picked up a bit on those who were chasing him, while Wells closed 15 seconds on Robertson, whose slowest lap of the ten was this one. No one of the drivers quit in this round, there still being ten cars which were in the running.

Eighth Lap—This round saw the elimination of Stutz in the Marion and Wright in the Stoddard. They had been far in the rear anyway and their dropping out did not alter the positions of the leaders. Matson had a slow lap and so did Monsen, but Robertson picked up a couple of valuable minutes, which improved his chances of getting second place. His 27:41 was the fastest of any of those battling for the cup.

Ninth Lap—At this stage of the proceedings Matson appeared like the winner, having an excellent lead. The Chalmers was running very sweetly and holding its own in point of speed with the others. Robertson was getting desperate at this point



Wiseman's Stoddard-Dayton Was One of the Finishers



Wells and the Moon, Which Finished in Sixth Place

HOW THE LEAD SHIFTED DURING THE RACE FOR THE INDIANA TROPHY, JUNE 18, 1909

No.	Car	H.P.	Driver	Mechanic	Tires	1st Lap	2nd Lap	3rd Lap	4th Lap	5th Lap	6th Lap	7th Lap	8th Lap	9th Lap	10th Lap
19	Chalmers-Detroit	25.6	Matson	Schnor	Michelin	11	3	1	1	1	1	1	1	1	1
10	Locomobile	32.4	Robertson	Ethridge	Michelin	8	8	7	5	4	3	3	3	3	2
6	Marion	28.9	Monsen	Robinson	Michelin	7	5	5	4	3	2	2	2	3	3
7	Locomobile	32.4	Florida	Campbell	Michelin	13	11	10	8	7	6	6	5	4	4
16	Stoddard-Dayton	24	Wiseman	Martin	Michelin	8	7	6	7	6	5	4	6	6	5
11	Moon	32.4	Wells	Goets	Diamond	10	9	8	6	5	4	5	4	5	6
17	Chalmers-Detroit	25.6	Poole	Gereau	Michelin	6	2	2	2	2	8	8	7		
1	Corbin	32.4	Maisonville	Aude	Diamond	4	13	12	12	10	9	9	8		
3	Marion	28.9	Stutz	Tinkler	Michelin	12	10	11	10	8	7	7			
18	Stoddard-Dayton	24	Wright	Bell	Michelin	15	12	12	11	9	10	10			
5	Chalmers-Detroit	25.6	Knipper	Richards	Michelin	3	4	3	3						
2	Buick	30.4	Burman	Crinnon	Michelin	1	1	9	9						
8	Buick	30.4	Chevrolet	Poirier	Michelin	14	6	4							
14	Buick	30.4	Strang	Hart	Michelin	2									
9	Fal-Car	28.9	Pearce	Stanfer	Diamond	5									
15	Fal-Car	28.9	Ruehl	Kutz	Diamond	16									

and he got his signal to "beat it" to the end. He was only 38 seconds behind Monsen and it seemed as if he would be able to overhaul the Marion before the final flag. Florida, too, was in good position, being fourth to his team mate's third, but 10 minutes behind him. He passed Wells, who had had to change spark plugs and dropped back a place.

Tenth and Final Lap—To win the race Robertson had to make up 8 minutes on Matson in one round, which was manifestly impossible the way the Chalmers was running. The only chance Robertson had was to have Matson meet with some mishap and that hardly seemed likely. Therefore Robertson was out to climb to second place and he set out to pass Monsen, who was putting up the gamest kind of a fight for the honor of being runner-up. But Robertson did not spare his car and he clipped off 27:40 4-5. Matson made a strong finish and did 26:59. On the other hand, Monsen ran his slowest lap of the ten, it requiring 30:49 for him to make the circuit just when even seconds were precious. This slow lap sent him to third. Florida held fourth place, into which he had climbed in the previous round, and the only shift in position of the others was the passing of Wells in the Moon by Wiseman in the Stoddard. This left the final positions: Matson, Chalmers, average 51.4 miles per hour; Robertson, Locomobile, average 50 miles per hour; Monsen, Marion, 49.5 miles per hour; Florida, Locomobile, and Wiseman, Stoddard, 47.4 miles per hour, only 14 seconds separating them, and Wells, Moon, 46.9 miles per hour. At the end Poole in the Chalmers and Maisonville in the Corbin still were running, although hopelessly out of the fight.

AVERAGE SPEED OF LEADERS IN INDIANA TROPHY

Car	Driver	Miles	Time	M.P.H.
Chalmers-Detroit	Matson	232.74	4:31:21	51.5
Locomobile	Robertson	232.74	4:39:03	50.0
Marion	Monsen	232.74	4:42:03	49.5
Locomobile	Florida	232.74	4:54:02	47.5
Stoddard-Dayton	Wiseman	232.74	4:54:16	47.4
Moon	Wells	232.74	4:57:27	46.9

REGULARITY OF RUNNING FOR INDIANA TROPHY

Car	Driver	Fastest	Slowest	Variation
Locomobile	Florida	28:42	30:49	2:07
Locomobile	Robertson	26:40:4-5	29:00	2:19 1-5
Marion	Monsen	27:27	30:19	2:52
Chalmers-Detroit	Matson	25:41	30:31	4:50
Stoddard-Dayton	Wiseman	27:33	33:56	6:23
Moon	Wells	27:52:3-5	34:31	6:38 2-5

FASTEST LAPS OF THE INDIANA TROPHY RACE

Car	Driver	Lap	Time	M.P.H.
Buick	Burman	1	23:41	58.9
Buick	Chevrolet	2	24:13	57.6
Buick	Strang	1	24:32 2-5	56.9
Chalmers-Detroit	Matson	3	25:41	54.4
Chalmers-Detroit	Knipper	4	25:40	54.4
Chalmers-Detroit	Poole	4	26:26	52.7
Corbin	Maisonville	1	26:28	52.7
Fal-Car	Pearce	1	26:32 1-5	52.6
Locomobile	Robertson	10	26:40 4-5	52.3
Marion	Monsen	2	27:27	50.8
Stoddard-Dayton	Wiseman	3	27:33	50.6
Moon	Wells	2 & 3	27:52 3-5	50.0
Locomobile	Florida	9	28:42	48.6
Marion	Stutz	2	28:55	48.3
Stoddard-Dayton	Wright	2	32:04	43.5

STOCK CHASSIS RACE FOR THE INDIANA TROPHY, JUNE 18, 1909—DISTANCE, 232.74 MILES; CIRCUIT, 23.27 MILES

No.	Entrant	Driver	1	2	3	4	5	6	7	8	9	10
19	Chalmers-Detroit	Matson	23.27 M	46.54 M	69.82 M	93.09 M	116.37 M	139.64 M	162.91 M	186.19 M	209.46 M	232.74 M
			29:00	0:54:43	1:20:24	1:46:29	2:12:19	2:38:45	3:05:50	3:33:21	4:04:22	4:31:21
				25:43	25:41	26:05	25:50	26:26	27:05	30:21	28:01	26:59
10	Locomobile	Robertson		0:55:52	1:23:43	1:51:38	2:19:49	2:48:21	3:17:21	3:45:02	4:12:22.2	4:39:03
			27:58	27:54	27:51	27:55	28:11	28:32	29:00	27:41	27:20.2	26:40.8
6	Marion	Monsen		0:54:56	1:22:27	1:50:01	2:17:30	2:45:26	3:13:15	3:43:29	4:11:44	4:42:03
			27:29	27:27	27:31	27:34	27:29	27:56	27:49	30:14	28:15	30:19
7	Locomobile	Florida		0:59:53	1:28:57	1:57:56	2:27:10	2:56:16	3:25:22	3:54:31	4:23:13	4:54:02
			29:55	29:58	29:04	28:59	29:14	29:06	29:06	29:09	28:42	30:49
16	Stoddard-Dayton	Wiseman		0:55:34	1:23:07	1:57:03	2:26:58	2:56:06	3:24:03	3:55:08	4:24:36	4:54:16
			27:58	27:36	27:33	33:56	29:55	29:08	27:57	31:05	29:28	29:40
11	Moon	Wells		0:55:52.6	1:23:45	1:52:02	2:23:11	2:55:41	3:24:26	3:53:51	4:23:56	4:57:27
			28:00	27:52.6	27:52.6	28:17	31:09	32:30	28:45	29:25	30:05	34:31
17	Chalmers-Detroit	Poole		0:53:36	1:20:28	1:46:54	2:14:17	2:41:18	3:08:18	3:35:18	4:02:18	4:29:18
			26:44	26:52	26:52	26:26	27:23	30:01	43:00	32:28	30:34	
1	Corbin	Maisonville		2:04:27	2:36:15	3:05:15	3:34:35	4:03:16	4:32:09	5:01:12		
			26:28	1:37:59	31:48	29:00	29:20	28:41	38:53	29:03		
3	Marion	Stutz		0:58:29	1:30:26	2:02:55	2:32:07	3:01:44	3:35:36			
			29:34	28:55	31:57	32:29	29:12	29:37	33:52	Ditched.		
18	Stoddard-Dayton	Wright		1:46:50	2:26:26	2:58:48	3:33:06	4:08:10	4:44:53			
			1 14:46	32:04	39:36	32:22	34:18	35:04	36:43			
5	Chalmers-Detroit	Knipper		0:54:53	1:20:47	1:46:27						
			25:55	28:58	25:54	25:40	Out.					
2	Buick	Burman		0:49:46	1:25:58	1:58:30						
			23:41	26:05	36:12	32:32	Disqualified for replacing valve.					
8	Buick	Chevrolet		0:55:28	1:21:31							
			31:15	24:13	26:03	Out.						
14	Buick	Strang		24:32.4	Out.	Broken axle.						
9	Fal-Car	Pearce		20:32.2	Out.							
15	Fal-Car	Ruehl		3 49:48	Out.							



Mm. Hauvette-Michelin,
Matlack, and Robertson



A Group of Crown Pointers



The Hospital Tent



Along the Pits



Bill Bailey, Lubricator



Beecroft and Edwards
at Work



Notables: Ryan, Ade,
Reeves, Wagner,
Stevens.

Winner Matson



Paine, Wagner
and Trego



Gentleman from Indiana

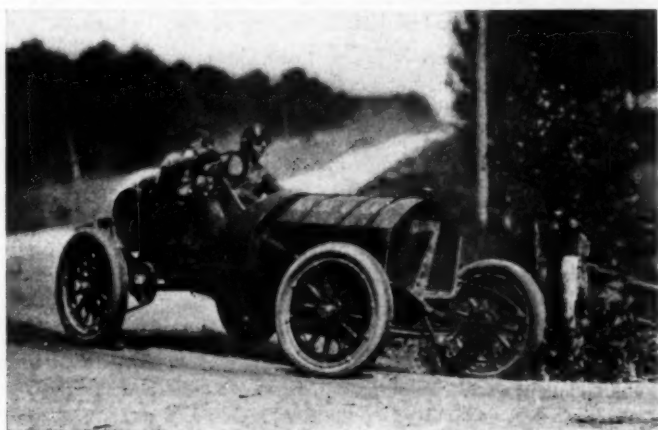


Everybody was Happy

THE GOSSIP OF THE STOCK CHASSIS RACES

Hard Luck of the Corbin—First of the cars to start in the Indiana Trophy race was the Corbin, driven by Maisonville, who had good reason to bemoan the fate that put him out of the running on the first day. There was considerable difficulty in getting the soldiers placed around the course, so much so that the start of the race was delayed for an hour. Supposedly by that time the truckloads of militia had been entirely distributed, but despite the red-flag signal which greeted the Corbin as it came up a rise in the second lap a heavy truck occupied the center of the road on the down grade following. It was a case of slap on the brakes, which burned out very quickly and settled all chances of the Corbin participating in the real battle, although Maisonville got going again and was running lap after lap well under 30 minutes when the race terminated.

Some Grand Stands Were Out of Sight and Empty—Nearly a hundred grand stands of varying sizes and pretensions had been built by farmers and others around the course in order to secure some of the fabulous wealth supposed to be expended at automobile races, if reports from the East were to be believed.



Dennison (Knox) Who Made Record Lap of Course

The inhabitants of the district who had built soon began to figure losses, for most of the seats went begging and those who did pay for a "stand-seat" had plenty of room. Even the big stand erected to hold 10,000 persons, at \$5 each for the two days, right at the finish, was not half filled on either day, and the parking spaces across the way had two banks of cars—in a few spots. The idea of those in charge that \$15 and \$10 spaces would be in demand was sadly blasted. Lumber was cheap on the day after the tourney.

Lytle Said Course Was Worse Than Briarcliff—After he had given up the struggle because of rear springs broken in the stretch of soft gravel road and backed his Apperson in behind the press stand, "Herb" Lytle said:

"The course is in awful shape for a short stretch. If I could have saved the machine in any sort of shape I would have kept running on three springs. The Briarcliff course was bad, but the one spot in this is worse. All the cars are slowing up over it as they strike their running gear, so badly is the road cut up. Other parts of the road are fine. This bad spot must be built over if the race is to be run again."

The bad spot was a mile long in the stretch leading to the finish, about five miles from the tape.

"Wag" Delighted the Westerners—Fred J. Wagner, the starter of the really big races, was once an inhabitant of the Windy City, but the races on the Crown Point course were the first of their kind in that section of the country, and consequently the first which he started there. So all the papers and many in

the crowd were awed and pleased with his "Ten, nine, eight, . . . three two GO." It sounded realistic, and gave the crowds the feeling of hearing something of which they had previously read. So "Wag" was an extraordinarily noted personage, and all the youngsters in Crown Point are making raids on the clothing stores for checked short pants, leather puttees, and German caps with leather visors.

Michelinites Were Happy—Among the naturally interested onlookers were: M. Hauvette-Michelin, who is the executive head of the American factory of the Michelin Tire Company at Milltown, N. J.; Manager "Jack" Matlack and Advertising Manager Bramwell. With such a preponderance of cars equipped with Michelins the Milltowners were inclined to feel quite confident, though they could not resist the enthusiasm which naturally followed in the wake of the victory. M. Hauvette-Michelin has seen all of the principal European races, but his first American experience was at Savannah and the second at Chicago.

Indiana Trophy Presented to Matson—Clothed and in their right minds, Joe Matson and Mechanic Dan Vaughn were re-



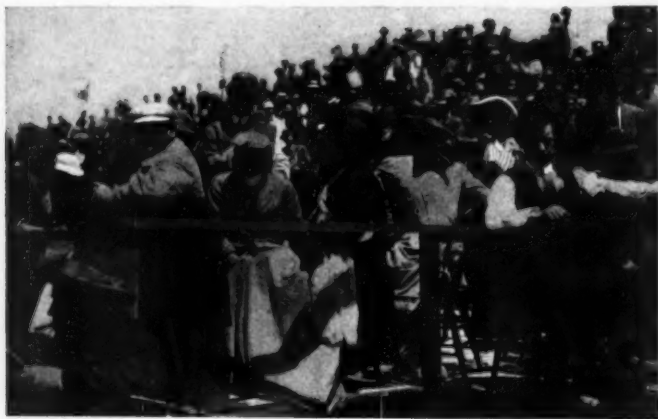
Maisonville (Corbin) Who Failed Through No Fault of Car

cipients of the Indiana trophy and a great ovation just before the start of the big car event. The winner of the light car race came to the stand in the victorious Chalmers-Detroit, President Ira M. Cobe of the Chicago Automobile Club presenting the handsome silver cup to Matson. The appearance of the crew was far different from their looks when they completed their work on the previous day, for straw hats and light spring suits had replaced the oily sweaters and jerseys of the racing togs.

The Commercial Hotel at Crown Point, Ind.—With race headquarters at Crown Point, the Commercial Hotel, of which Mrs. Beers is the hustling manager, assumed some importance in the matter of providing food and lodging for the thousands. One inconsiderate boarder found fault with a towel which had done much service in the public washroom and registered a kick with Mrs. Beers, who came back with the emphatic remark that "Over forty men have used that towel and you are the first one to kick." There was no clean towel forthcoming!

Harry Knight the Dean of the Timers—From Boston came the man who took charge of the timing of the cars in their flights. Harry Knight is a well-known figure in New England automobiling, and he has extended his timing operations to various parts of the country. With his trusty chronometer and array of stop-watches, Knight saw that the timing of the autos was made accurately and without friction. "Demountable" Nadall lent a good hand in the job.

Arrangements Were Wonderfully Good—Perfection in management and preparations were everywhere evident, sub-



The Cobe-Myers Grandstand Box

stantiating the fact that what the people of the West do is generally done well. Miles of woven wire fencing had been erected to keep back the crowds, 23 miles of asphalt road had been laid, the press stand was a joy to the busy newspaper men, the telegraph wires, telephone lines, and viaducts were well placed, and the soldiers were real.

Matson a Former Cyclist with "Dutch" Waller—There were those at the race who did not recognize in Matson, the winner, an old-time bicycle rider, an honor which carries a bond of unity with it, among those who graduated from bicycles to automobiles, and are now looking forward to aeroplanes. Matson was once the racing partner of "Dutch" Waller, who was well known in the six-day events, and later as the engineer of a motorcycle.

How a Broadwayite Got Stung—"Sid" Bowman was among the "Broadwayites" who fell victims to the wiles of the local Hoosiers, who naturally were after money when such easy picking abounded. "Sid" boarded a 'bus bound for the grandstand, paid his way upon demand after only a small fraction of the distance had been traversed and then was dumped out a mile from the destination point.

The Locomobile Party—One of the grand-stand boxes was occupied by a Locomobile contingent which consisted of President S. T. Davis, Jr., and Mrs. Davis, Mr. and Mrs. A. L. Riker and Mr. and Mrs. R. A. Greene. Before Robertson had his magneto troubles the Locomobile adherents were inclined to be fairly confident, though when the hard luck came, the situation was accepted heroically.

Equipment on the Winners—Tires, magnetos and carbureters receive their share of honors in victories such as those of the Buick and Chalmers-Detroit cars. Chevrolet's Buick used a Schebler carbureter, Remy magneto, and Michelin tires. The Chalmers-Detroit, driven by Matson, in the Indiana cup race,



Chalmers at Wheel with Designer Coffin in Tonneau



Includes the Locomobile Box Party

used a Kingston carbureter, Bosch magneto, and Michelin tires.

Of Course, John Farson Was on Hand—Resplendent in a suit of immaculate white, with red hatband and tie, John Farson, ex-president of the Chicago Automobile Club, was one of the shining lights. L. E. Myers, president of the Illinois State Association, and Sidney S. Gorham, who was secretary of the A.A.A. during Mr. Farson's administration, were also to be seen.

Ford and Firestone—Henry Ford, in company with Tire-maker H. S. Firestone, was a keen-eyed though quiet observer of the racing, which he admitted that he enjoyed thoroughly, even though his small car entrant was unable to be a starter. Seattle was Mr. Ford's destination in the evening after the finish of the Cobe race.

Happy Chalmersites—The Chalmers-Detroit camp was located at Lowell and here, after the small-car race, came Hugh Chalmers, Mr. and Mrs. Howard Coffin, Roy D. Chapin, Harry Ford, "Jim" Levy (of Levy & Whipple, the Chicago agents) and many others who believe in the car from Detroit.

Among Those Present—Of course, the list of real notables included such well-known figures as H. O. Smith, chairman of the A.M.C.M.A. executive committee; Alfred Reeves, the general manager; Samuel B. Stevens, now of the A.A.A. contest board, and Dr. J. B. Parks, of Boston.

Referee Paine Represented the Northwest—From one of the "Twin Cities" came the highest official of the day, Referee Asa Paine, a man well acquainted with the intricacies of automobile race management and once president of the Florida East Coast Automobile Association.

Chairman Hower Was an Onlooker—Chairman F. B. Hower, of the contest board of the A.A.A., was an unobtrusive observer of the sport, being in the company of F. C. Donald, president of the Chicago Motor Club.



President Cobe Presents the Indiana Trophy

FORDS AND SHAWMUT NEAR SEATTLE

SEATTLE, WASH., June 23—Ford cars and the Shawmut, in the race from New York to this city, are expected to reach here this evening or early to-morrow morning, and they are all within 125 miles of the finish. Ford No. 2 is leading, with the Shawmut second and the Ford No. 1 third. All three are out of the realm of telegraphic communication, but it is estimated that Ford No. 2 would have been ferried across Lake Kitchell late yesterday afternoon, would have run all night, and is now approaching the city. At 2:30 yesterday afternoon it was reported well along towards Snoqualamie pass; and at Ellensburg, 128 miles east of here, the Shawmut was reported yesterday morning as eight hours and 15 minutes behind the leader, but with its crew in better condition, and expecting to make up much time. The Shawmut passed Ford No. 1 out from Walla Walla, running well. The last report on the Acme was when it left Rawlins on Monday afternoon in good condition; and the Itala reached Denver on the same day, and prepared to continue northward.

The roads since leaving Rawlins have been very rough, often very bad, and once in a while good enough for fast work. The positions of the cars have not shifted as much as they did last week, when every car held the lead at some time en route, for the principal change has been in the overtaking of the Shawmut by Ford No. 2. The former left Rawlins four hours in the lead, but at Montpelier, Id., on Friday, Ford No. 1 arrived first, the other two cars having trouble 30 miles east of that place. They were quickly repaired, however, and the Shawmut secured a few minutes lead of No. 2. Ford No. 1 replaced a front wheel and a spring at Montpelier. On Sunday morning the Ford No. 2 reached Boise, and thereby won the \$100 offered by the Commercial Club to the first arrival, for the other Ford had lost its way in the desert and its team-mate went into first place, the latter reaching Boise on Sunday afternoon at 2:30, and the Shawmut an hour later. In the race the matter of minutes became important as the contestants neared this State. Baker City, Ore., the only checking station in that State, was reached at 3:45 P. M. on Sunday by the No. 2 Ford, having covered the 160 miles from Boise in seven and three-quarter hours, and the crew pushed right on towards Walla Walla, 130 miles further. The Acme on that day was reported as leaving Boster, Wyo., where it had been held up by a broken jack-shaft.

That the cars were always on the go, is seen from the fact that the leading Ford reached Walla Walla at 6:45 A. M. on Monday, and after a rest of two hours pushed on towards this city, 291 miles further. The other Ford and the Shawmut were then en route from Baker City, the Acme had passed Rawlins, and the Itala had reached Denver. The roads from the position of the leader are good and local automobilists are awaiting a report of the cars to locate them, and then go out to meet them.

RUN TO WILDWOOD NEXT IN JERSEY

NEWARK, N. J., June 21—Members of the New Jersey Automobile and Motor Club still have two weeks in which to enter for the club run to Wildwood on July 3, but already enough have signified their intention of participating in this roadability affair to insure its success. The announcement of some very prominent entries in the straightaway races to be held at the shore has increased the interest in the week-end tour. Joseph H. Wood, chairman of the contest committee in charge of the recent amateur run, has announced that the club will conduct an open endurance contest under more rigorous conditions late in August or early in September, which will include a technical examination of the contestants at the completion of the event. At a meeting of the board of trustees, resolutions were adopted against the proposed "Jersey jubilee run" of some New York autoists, scheduled for July 1, 2 and 3. The promoters of this event plan to conduct it as a celebration of the passage of the amendments to the automobile law permitting out-of-the-State tourists to use Jersey roads for a nominal sum, and this method of expressing joy does not meet with favor in this city.

SAVANNAH NOW INTERESTED IN AUTO RUNS

SAVANNAH, GA., June 21—Endurance runs and tours are of greater interest to automobilists of this city at present than has any one thing been since the Grand Prize race. With the successful conclusion of the contest to Augusta comes offers of other termini, in the hopes that the Savannah Automobile Club will use its organized methods of management in conducting future events. Hon. Clark Howell, editor of the *Atlanta Constitution*, has offered to give over the management of the run to Atlanta to the local body, and a meeting of the executive committee has been called to consider it. This run is in line with the many proposed for the good roads movement, and would be an additional contest along the same campaign as that of the *Savannah News*. On Friday it is expected that about 150 automobiles will go to Atlanta for the inauguration of Governor-elect Brown, which occurs on Saturday, not only to give their owners and passengers the view of the ceremony, but also to get the new Governor well interested in the automobile and good road enthusiasm. The plans call for the start of fifteen cars from Fitzgerald, picking up others at Macon, Waycross, Thomasville, Perry, Jonesboro, and other places en route, while from every part of the State other cars will make the journey.

So far no word has been received from the Automobile Club of America as to a suitable time for a meeting between its contest committee and that of the local club. Savannah desires to prepare for another grand prize meeting, and awaits the co-operation of the New York body.

STODDARD-DAYTON WINS DELAWARE RUN

WILMINGTON, DEL., June 21—Thomas M. Brown, in a Stoddard-Dayton touring car, won the fourth annual roadability run of the Delaware Automobile Association, which was held on Saturday. The event was of the sealed-time variety, in which the cars were checked at certain points and the one which came nearest to reaching controls on time was declared the winner. Mr. Brown was penalized 24 points; second was W. L. Hammond, Mitchell, 28; third, A. B. Hazzard, Mitchell, 29. There were 23 starters for Dover in the morning, and of these 18 finished. The route took the contestants to Dover and back. Those others who finished were: W. H. Jones, Rambler; G. S. Woodward, E-M-F; Dr. J. C. Fahey, Stoddard-Dayton; Mrs. J. C. Moore, Cadillac; T. C. Bradford, E-M-F; H. F. Dougherty, Ford; C. M. Beadenkoph, Cadillac; C. B. Harris, Cadillac; W. J. Gibbons, Franklin; J. B. Bird, Franklin; R. S. Baird, Stoddard-Dayton; W. E. Anger, Autocar; E. E. duPont, Stoddard-Dayton; Mrs. E. E. duPont, Buick; R. T. Elliott, Buick.

LONDON'S OMNIBUS TRAFFIC STILL DECLINING

In the last available figures on the subject of the omnibus traffic in greater London, it is apparent that the traffic is still low and does not rise as it was expected to do. For the week ending May 29, while the traffic increased but £5,164 (\$25,820), the total for the year up to that date showed a loss of £32,051 (\$160,255), this amounting to 4.4 per cent decrease. In the same time for the Tubes showed an increase of £14,528, and the figures for Tramways revealed a gain of £60,488. Added to this the increase on the part of the Shallow Railways of £33,465, make the omnibus situation particularly noticeable. Against the handsome gains on the part of all other methods of transportation this is sufficient to bring the total gain for the year for all systems down to £76,430, equivalent to but 2.9 per cent.

NINE CONTESTANTS IN BINGHAMTON RUN

BINGHAMTON, N. Y., June 21—Nine contesting and one official pilot car left this city this morning on the fourth annual tour of the Binghamton Automobile Club. The route includes night stops at Albany, Boston, Hartford, and Newburg, returning to the starting point on next Saturday.

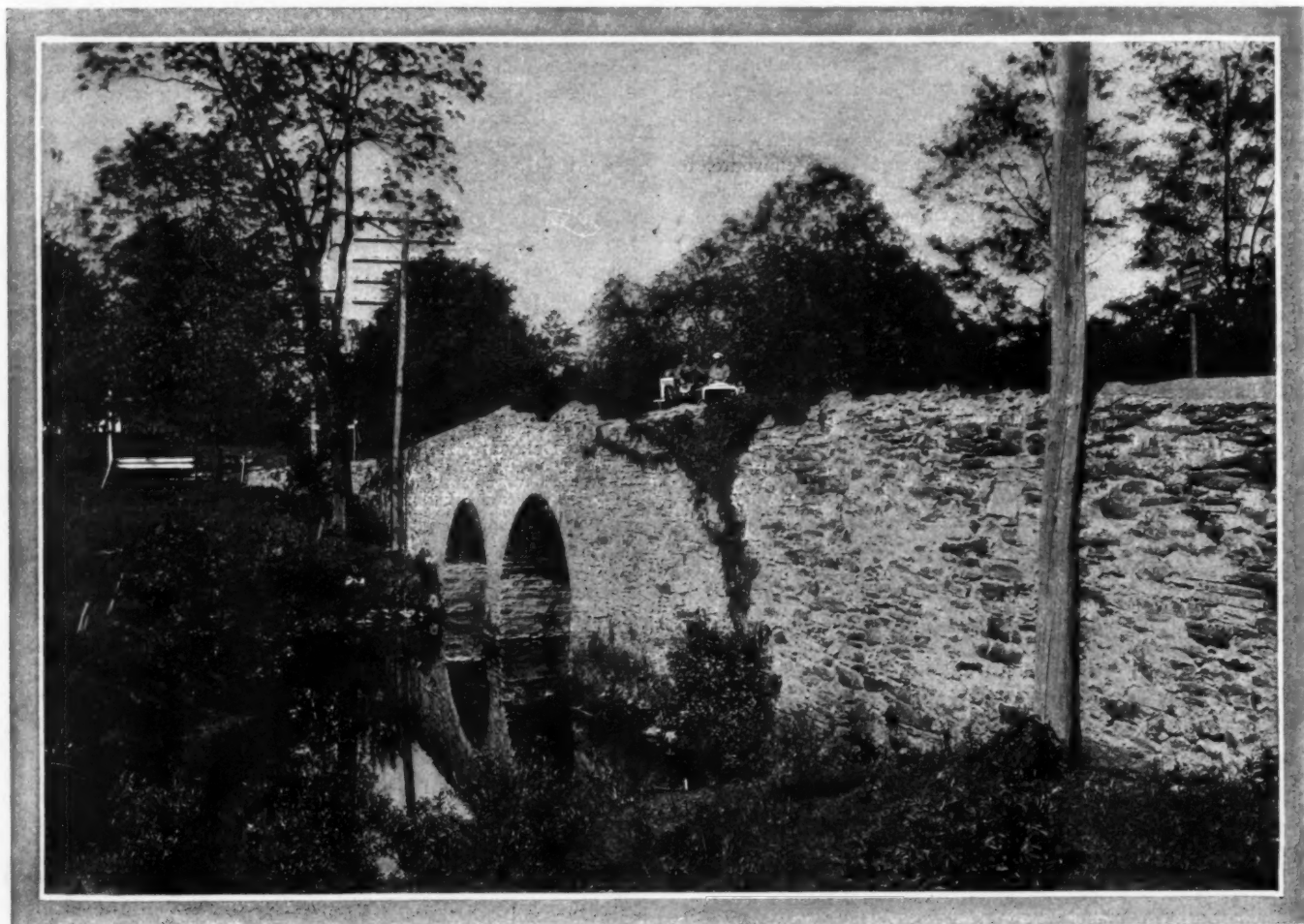
MAKING OF AN EPOCH IN GOOD ROAD CONSTRUCTION

By COKER F. CLARKSON, A. L. A. M.

THERE is under way a movement going to the foundation of things in the good roads matter. To many good roads are an uninteresting and hackneyed subject. But of their vital necessity and of the advisability of constantly urging their construction, there should be no debate. No other improvement will pay to the people such dividends as modern highways. A nation's reputation for enterprise, progress and all that goes to make it worth living in, is determined very largely by the character of its roads, the great arteries through which flow the business and pleasure of the nation.

down large flat stones. Then in France rough stones were set on edge, a layer of broken stone being superposed. A similar theory was later followed in England. Early in the nineteenth century McAdam announced the principle that small pieces of broken stone placed in a layer are, by the action of water and travel, transformed into a homogeneous road surface. Years afterward the road-covering effect of crude oil became known.

It is now pretty generally recognized by highway engineers that the macadam road is, for modern conditions, obsolete, and that from now on first-class roads must, by the admixture of



Where the Highway That Leads from Trenton to Philadelphia Crosses a Picturesque Bridge at Langhorne, Pa.

The public road is a principal feeder of our civilization. We take pride in our crops and products, often forgetting public roads must bear them to market. We lead the world in railroad building, but for every mile of railroad we have ten miles of highway, such as it is. Perhaps this in a way indicates the relative importance of improved highways.

The benefits to be derived from a reasonably good common road system would be shared by all classes: the farmer reaping a better profit through easier transportation to commercial centers; the inhabitants of towns and cities by the product of their labor reaching the rural districts more economically. This is a fair analogous deduction from the history of the reduction of freight rates by the improvement of roadbeds and rolling stock, to which much of what science, experience and invention have developed has been applied.

The history of good road construction all over the world reveals only a few fundamental methods. The Romans laid

proper ingredients, have a mastic property, by virtue of which dustless roads will become a reality, and undue depreciation from disintegration of the road be avoided.

The good roads problem, although precipitated by the automobile, has been left alone for generations, and extends in its far-reaching importance and effect much further than the consideration of its relation to the automobile; in fact, as far as any economic question can reach. The automobile is broadly a medium of communication and traffic, upon which the very life of the nation depends. Roads are simply media for facilitating traffic, incidental to animate and mechanical road traction, and not an end in themselves. This last should be obvious, but some seem to think the preservation of roads out of date for modern purposes is the great desideratum. But progress in fundamental matters cannot wisely be impeded by incidental considerations. It is clear that the automobile is an improved method of accomplishing a fundamental function.

Indicator Cards and what they Delineate

BY THOS. J. FAY

INDICATED HORSEPOWER, referring to a motor, differs from the actual delivered power by the mechanical losses. Just what the mechanical losses are is largely dependent upon the design of the motor in any given case and because of this fact the indicator becomes of the greatest value for, by its use in conjunction with a dynamometer, it is possible to ascertain not only the power that a motor will deliver, but the losses mechanically, so that the best speed at which to gear the motor with a view to the highest fuel efficiency will be arrived at.

The indicated horsepower of a motor will depend upon the factors as follows:

Let

P = mean effective pressure in pounds per square inch.

L = length of power stroke in feet.

A = area of piston in square inches.

N = number of power strokes per minute.

When

$$\text{I.H.P.} = \frac{PLAN}{33,000} = \text{indicated horsepower.}$$

The length of stroke and the area of the piston, since they are dimensions of a motor that do not change, can be ascertained with good accuracy at will, while the mean effective pressure, as well as the speed, are the two factors that cannot be fixed offhand. It is common practice to assume that the speed will be, say, 1,000 revolutions per minute, but this practice is without any good foundation at all, on the ground that the speed depends upon several considerations that cannot be arrived at excepting as the result of an actual test after a motor is built, although it is possible to approximate the speed performance in the process of design if the problem is approached in due form.

At all events, when a motor is finished and it is desired to ascertain just what it will do it is the indicator in some form or other that is adopted with the view of procuring what amounts to a photograph of the curve of pressure of the gas in the cylinder during the several cycles, and since the curve can be measured, it is possible to determine the mean effective pressure throughout the strokes. The same photograph (card) will tell if the suction pressure is excessive; if the valves open early or late and if the ignition is adequate and properly timed. There is also the back pressure to be disposed of if it is sufficient to reduce the power of a motor beyond a slight amount and if the muffler is not good for the purpose; by means of the indicator it is possible to ascertain the fact by the simple expedient of taking off a card with and without the muffler.

Indicators as they are used in steam work are not so well adapted to such high speeds as when automobile motors of the internal combustion genera are to be investigated, and the modern method involves the use of a "manograph," diagrams from which show exactly the same information as that obtained from indicators of the conventional

sort, excepting that the accuracy of the manograph is its best recommendation notwithstanding high speeds of the motor to be tested. Since the cards in each case are of the same general character it will be unnecessary to describe either of the forms of equipment at this time, rather with the expectation that these matters will ultimately be afforded a measure of space for their proper elucidation.

Typical Indicator Card Showing Characteristic Points—Before technically discussing manographs used to bring out the points to be made a typical card will be exposed for the purpose of rendering the text clear. The card, Fig. 1, is therefore offered, and as will be observed, the stroke of the piston is depicted by the line A B at the atmospheric pressure, which is 14.7 pounds per square inch (closely); the distance A C is equal to the clearance between the top of the stroke and the dome of the combustion chamber. The compression line is shown from the point B to the point of convergence into the explosion line, terminating at E, and the expansion line, extends from E to B. On the suction stroke the line of pressure shows below the atmospheric line, difference in pressure being but slight in the better types of motors. The exhaust on the scavenging stroke is a maximum at the point B and should fall away to the pressure of the atmosphere at the point A; this is rarely true in practice, especially when a muffler is used, provided the same silences the noise of the exhaust as perfectly as is the wont of the average autoist. The power that can be taken from one cylinder of a motor is equal to the area of the enclosure of the compression, explosion and expansion lines, from which must be subtracted the area of the enclosure of the atmospheric and the admission line together with the area of the enclosure of the atmospheric and the exhaust line. The power so found will be indicated, from which must be subtracted the mechanical losses of the motor, including the power required to drive the accessories, as pumps for oil and water, also the magneto used for ignition purposes. A planometer may be used for the purpose of ascertaining the area of the surfaces enclosed by the respective boundaries and the strength of the spring used in the indicator must be considered in the process of determining the power of the motor in a manner as will be shown in the discussion relating to instruments and measurements. The power above alluded to does not take into account the losses in the transmission system, as clutch, gears, differential, bearings and from vibrations.

Practical Results as Depicted on Cards—These diagrams, as shown in Fig. 2, were originally taken for the purpose of determining the efficiency of sparking equipment in some experiments conducted by W. Watson, and a paper by him was discussed before the Automobile Club of Great Britain bearing upon the ignition phase of the situation. The cards, however, portray much more than was brought out at the time and they are unusually good for the purpose. The motor was of the 2-cylinder type, 3 1-2 by 4 inches bore and stroke, respectively, and the speed of the motor was

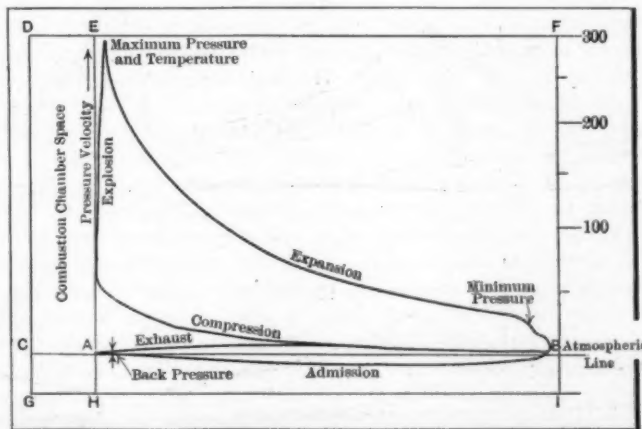


Fig. 1—Characteristic indicator card for use as a key to the cards, as shown in Fig. 2

held between 950 and 1,000 revolutions per minute while the cards were taken off.

Two diagrams are shown on each plate, marked a and b, respectively; effect of energy in the spark is shown at a glance, for the second diagram on each plate was taken with a weakened spark in each instance. The cards designated as (a) were taken with the strongest primary current that would afford results on an increasing basis and the diagrams marked (b) were taken with the weakest current in the primary of the coil used that could be employed and not have missing explosions during the period of operation.

In this experiment the sparking distance was tried out at .25, .5 and 1 millimeter with little or no difference in result, so that the final work was conducted with the sparking distance held at .5 millimeters separation. This is one of the matters that would naturally show up on an indicator card, and it is well worth noticing that the spark-gap may vary over broad ranges without affecting the efficiency of performance of the motor. In the case of the card B it will be observed that the diagram (b) is imprinted twice, one of which is with a higher explosion pressure than the other by a considerable margin; this was due to the scavenging effect of a "miss," the explosion that followed the "miss" was relatively violent, due to the better conditions of scavenging, and this is one of the best points to be determined in an investigation of this sort.

The card C shows the result of excess air dilution, in which it will be observed that the highly inflammable charge was fired quite as well with the weak spark as with the spark that emanated from a strong current. In this case, however, the explosion pressure was below that which would be produced were the mixture normal in view of the compression pressure shown, which was relatively high, thus indicating that the ratio of

explosion to compression pressure is neither constant nor to be relied upon if the ratio of gasoline to air is altered sufficiently to lower the rate of flame propagation very much. On the other hand, this card shows that the best fuel efficiency will fall somewhere in the vicinity of the mixture that will propagate a rapid flame, and sparking troubles will so be much reduced in such cases; this card shows that the spark does quite as well when weak as when strong if only the mixture holds enough excess oxygen to render it quick burning. On the other hand, excess oxygen can be overdone, in which event the mixture will not be quick burning and the weak spark will fail to perform in a satisfactory manner.

What the several cards show, from the point of view of suction pressure, is a certain uniformity, rather than any very definite results; as an example of an appreciable area of the suction portion of the diagram, it is possible that the examples B and I are the most conspicuous; the depression, below the atmospheric line in these cases, is sufficient to warrant the belief that the motor was contrived with quite small valves, and that the intake was somewhat restricted in area, or the carbureter was of the class to afford easy starting of the motor, rather than efficient power service. That there is a vast opportunity to engender losses in a motor by having a considerable depression in the intake is one of the matters that will be fully illustrated if the exponent "N" is calculated for the several depressions. It has been shown in another place that the compression is affected by the numerical value of the exponent named, which exponent is not far from 1.3 when the depression during the suction is 1.7 pounds per square inch, making the absolute pressure 13 pounds per square inch. In a general way, when the suction pressure is pronounced, it is desirable to ascertain if there is some way to free the suction, sufficiently to lower the suction pressure, with-

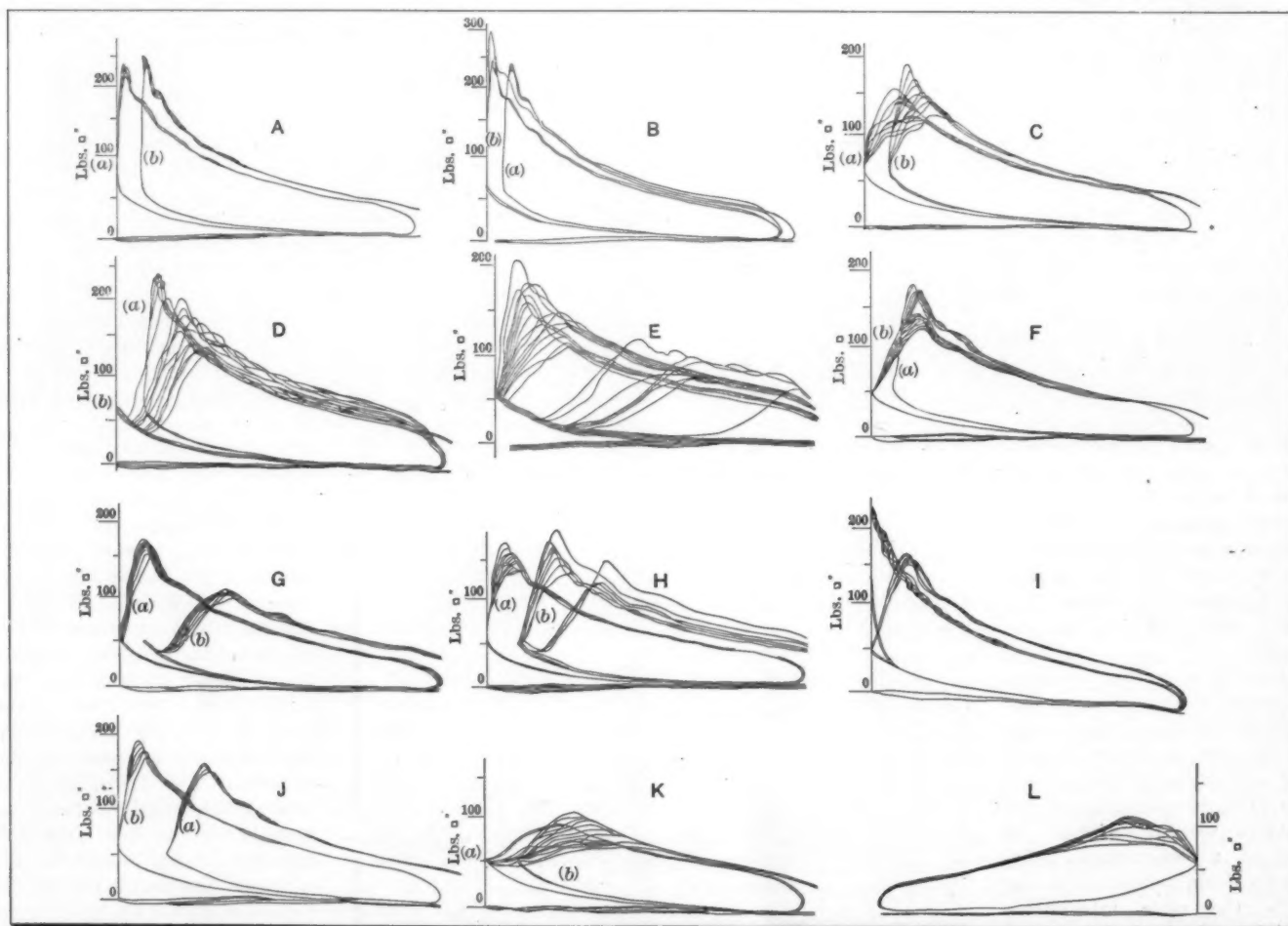


Fig. 2—Indicator cards showing the effect of early, late, weak, and strong ignition; also the usual variations that influence power

out, at the same time, reducing ability to start the motor, or undue cranking. Of course, there are two sides to this question; if the suction pressure is insufficient to afford a full measure of mixture, the power of the motor will fall off in response to the diminished weight of the same; on the other hand, if the pressure is excessive, it will show in any attempt to balance the cyclic losses, the one against the other. If the suction pressure is, say, two pounds per square inch, this negative pressure must be compared with the mean effective pressure on the power stroke. To compare the suction pressure with the maximum pressure on the power stroke, is to overlook the fact that the suction pressure is nearly constant over the whole stroke, while the maximum pressure, during the power stroke, is very much in excess of the mean effective pressure. If the mean effective pressure is, say, 70 pounds per square inch, which is not far from the truth in many cases, then:

$$\text{as } 70:2::100:2.85$$

This is a rather large proportion, which, in the absence of other losses, would be a small matter; the back pressure, however, must be considered on the same basis. The diagram D is the only one that indicates the presence of any considerable back pressure, although, in motors in general, and especially when mufflers of an inferior character are used, the back pressure is material. If the losses of this character are indicated by the presence of, say, 5 pounds per square inch, back pressure, the proportion will look as follows:

$$\text{as } 70:5::100:7.14$$

This, too, is on the basis of 70 pounds per square inch, mean effective pressure. What the cards do not show, is the differences in compression pressure that would follow changes in speed; since the speed was held almost constant during the "indications," and in view of the constant conditions, in other directions, the compression pressure was nearly the same in every case. The card I shows a lowered compression pressure brought about by pre-ignition. This is just what one would expect under such conditions, and it is but a step to the conclusion that very early, functional, ignition will bring about the same result in some measure.

One of the safe conclusions then, must involve a certain precision of ignition, such as can only follow if the ignition equipment is capable; free from a variable time constant; with an adjustable means for advancing and retarding, as the speed of the motor changes. It is on this account that electrical ignition systems are found to be of greater superiority than other means thus far tried; the difference in the several electrical contrivances, for that matter, are sufficiently noticeable to require consideration to obtain superior results.

Influences That Affect the Maximum Pressure—It will be observed that the maximum pressure is not the same in all cases; the variations are not even in a constant ratio to the variations in compression pressure; it is usual to assume that the maximum pressure is equal to about four times the compression pressure, in motors in general, under normal conditions of operation; this is an assumption that is not always borne out by the facts, excepting, perhaps, in a given motor, at some one speed. The diagram I shows that the compression pressure is about 50 pounds per square inch, and in this case the maximum pressure is about four times, or, 200 pounds per square inch. This compression pressure is low, due, as before stated, to pre-ignition. The card B shows a compression pressure of 60 pounds per square inch, and four times this value would equal 240; instead of this value of the maximum pressure, an observation will show that it was slightly under 300 pounds per square inch. The higher value, as above given, was after a "miss," thus indicating that the conditions of scavenging were superior to the average in this motor, and as a matter of fact, for this motor, it is very likely that the maximum pressure would be equal to about 4.5 times the compression pressure.

In this motor, the compression pressure was low, as shown by every card taken, due, in a large measure, to the constricted intake, and to some extent to the speed at which the cards were

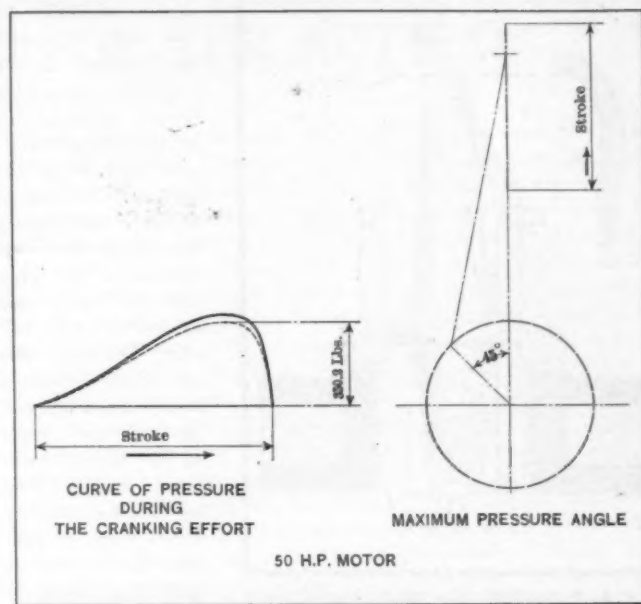


Fig. 3—Diagram showing the point at which maximum compression will show on the starting crank by inducing maximum pull

taken off. The card K indicated a very inferior condition of performance, the maximum pressure being about double the compression; this card was taken with a weak mixture. Against this, a glance at the card J will show the performance when the mixture was nearly normal, and it will be observed that the performance, as shown by J, was below the maximum expectation, due in this case to inferior conditions of ignition. In general, the ratio of maximum to compression pressure will be a maximum, under the conditions, as follows:

(A) The ratio will increase as the compression pressure is increased, up to a certain point, which point is at or near pre-ignition.

(B) The maximum pressure will obtain when the surface to the water (cooling) jacket is minimum, all other conditions constant.

(C) If the cooling provision is highly active, the compression pressure will be increased accordingly, and the maximum pressure ratio will fall off, but the mean effective pressure will be maximum.

(D) Bettering the conditions of scavenging will increase to maximum compression, as well, the mean effective pressure, without diminishing the compression pressure.

(E) Increasing the speed of the motor (the piston speed), beyond a certain point, will lower the compression; the maximum pressure out of proportion, and the mean effective pressure accordingly.

(F) Increasing compression, while it will have the effect of increasing the maximum pressure, will not produce a proportional increase in the mean effective pressure; the power of a motor, then, is not proportional to the compression pressure, nor is it proportional to the maximum pressure; the power is proportional to the mean effective pressure, however.

It was said, early in this discussion, that the speed at which a motor will do its best work is not to be assumed; it is no more possible to assume the speed than it is guess at the mean effective pressure. No two motors will perform in precisely the same way, in this connection, unless the features of design, and the conditions of operation, are in exact accord; it is even difficult to arrive at the same results when two motors of the same make, size, and even "shop order number," are tried out; it is on this account that one owner, of a given model of car, will realize good results, and another owner will receive but indifferent service.

The best speed of a motor is that which will afford the greatest measure of power, under conditions that will render the

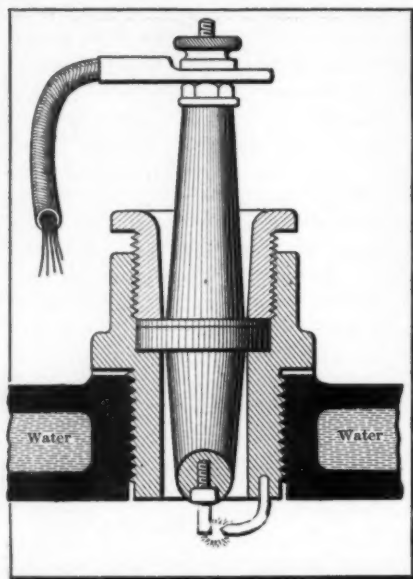


Fig. 4—Section of a sparkplug showing defective construction and loss of compression following the absence of packing

its regular work, observing the speed at the same time. In this way, it would be possible to ascertain if the gear ratio accords with the requirements, remembering that a motor that is held down to a low speed, may not be delivering its best power.

Effect of Leaky Valves and Pistons—Since the amount of gas that will leak by, in a given time, depends upon the pressure, it is a simple inference that the leak is not at a constant rate, due to the fact that the pressure is not constant. If the mechanism is in a leaky condition, the compression will be lowered, but the most marked effect will be in connection with the explosion pressure; in taking off cards, it is possible to ascertain if the system is leaky, provided the ignition is cut off (from the cylinder to which the indicator is connected) and note is taken of the point at which the compression line crosses the atmospheric line. If the junction is far out on the stroke, it is a sign of a leaky condition, although, as before stated, the compression pressure will be diminished, due to the loss of mixture. With the ignition cut off, if a leak is present, the expansion line will fall below the compression line, due, of course, to lost mixture in the process of compression, at an increasing rate during compression, and in the process of expansion.

Effect of Over-heating May Be Noted—If the cooling system becomes inefficient, due to a faulty water circulation, as when the water pump becomes leaky, or if the jacket surfaces become encrusted, excess heat will rarefy the incoming mixture, and the actual weight of gas will reduce accordingly. The card will show a lower mean effective pressure than will follow if the motor is allowed to cool off, or if the water circulation is corrected; two cards, one with the system heated, and the other with the motor cooled off, will tell the tale, and the loss will be found to be considerable.

The torque of a motor is readily obtained by a dynamometer, and the fuel efficiency will be found to increase with the torque, just as does the power, at a given speed.

Torque will decrease:

- (A) If the valves or the pistons leak;
- (B) In case the cooling is inadequate;
- (C) Provided the valves are not properly timed;
- (F) When the intake is restricted;
- (G) If the carbureter is too small;
- (H) Due to back-pressure, as when the muffler is stopped up;
- (I) If the ignition is not properly timed;
- (J) In any case, when the speed increases enough to reduce the weight of mixture, due to friction of the same against the walls, and in a molecular sense as well.

If the system is leaky, the torque will be lowered at reducing

speeds of the motor, due to increasing time, thus augmenting the loss of mixture; the torque curve will also slant in a downward direction as the speed increases, so that, in the average motor, after it has been in service for some time, it is to be expected that the curve of torque will slant downward at low as well as at high speeds, and indicator cards, at the several speeds, would show just such results, especially if the system becomes leaky, which is a normal expectation due to long service.

In actual practice it is possible for the average motorist to note the performance of his motor, from time to time, without having to resort to the use of an indicator, for the very simple reason that the cold compression will, in itself, serve to indicate the condition. From the point of view of leakage Fig. 3 represents the situation, in that it shows the maximum pressure angle, considering a certain motor, which should not differ much from motors in general, of the same power, and in this case, it was found that the maximum pressure (cold) came at 45 degrees, on the compression stroke, as shown by cranking the motor, as well as calculating for the curve of compression. A pair of scales, used to pull the starting crank up against the compression, is all that is necessary to show the value of the same at any time; hence, if the compression is reduced for any cause, it is possible to detect the difference. A gauge, attached to the cylinder, if it is provided with a stop, will serve as an indicator to go by, and a motorist, so equipped, will be in a position to check the performance of his motor, and if he finds that the cold compression is reducing, it is equal to saying that the power of the motor is diminishing.

Sometimes it is a small matter that causes a loss of compression, as a leak around a spark plug. Fig. 4 shows just such a plug, in which the packing is left out from under the seat where it presses down against the "boss" on the cylinder. The porcelain packing is indicated as above the enlargement; and the leak may also be up around the porcelain, and again, the packing is out from around the enlargement of the central electrode, thus allowing mixture to ooze by, and up along, the electrode. It takes but a very little leak to lower the power of a motor very much indeed, and the motorist who looks after this phase of the problem will rarely have to resort to the use of an indicator to ascertain why his motor fails to deliver the accustomed power.

One of the most mysterious leaks with which the motorist has to deal is due to sparkplugs, when they are new. Even if they are tight when they are first placed into service, it is highly improbable that they will stay so, and the proper measure is to tighten them up, after they get heated, allowing time enough for the packing to adjust itself to the heat that is normal to the performance. In this case reference is had to the packing in the entrails of the sparkplug, rather than to the packing ring that presses against the cylinder boss in consequence.

The indicator should be of the greatest advantage in affording more nearly exact information as to the right speed of a motor, or better yet, the timing of valves, and the spark that will give the best results at a given motor speed; certainly, it is not proper to time valves in precisely the same way, irrespective of the speed at which a motor is to run, when it is coupled into a car. The curve of torque of a motor is susceptible of manipulation, if the speed is adjusted, provided the valve timing is adjusted also, assuming that the camshaft is so suspended between bearings that it will not spring so as to destroy the setting of the valves, and if lost motion is eliminated.

A given car, of a certain weight, and of characteristics that are fixed independently of the motor, will take a certain amount of power to impel it, no matter what may be the character of the motor used. If the motor is not big enough to do the work, the car will not run, because if the motor is incapable of exerting enough twisting force, it will shut down. In setting a motor then, it is necessary to consider the power required; gear ratio, in view of the road conditions that have to be tolerated, and the service that the car is expected to perform, and if great flexibility is one of the prime requirements, the curve of torque must be examined.

KINKS AND WRINKLES FOR THE AUTOIST

By D. R. HOBART

UNFORTUNATELY for those who tour any great distance from home, repair shops are few and far between in many sections, and too often the local Vulcan is ready to attempt repairs but lacks the necessary ingenuity to cope with unusual cases of trouble. If the autoist does not possess skill in inventing remedies for such cases, and is minus the necessary spare parts, he is reduced to the ignominy of leaving his car in the care of the repairer and making a journey to the nearest agency for that particular make of car to replace the broken parts. Again, he may encounter the trouble on a comparatively deserted road and will have to wait for a tow from some passing team.

Efficient Spares and Tools to Be Carried—Occasions necessitating repairs are by no means of such uncommon occurrence as might be supposed considering the refinement and care in construction given to automobiles of the present day, but these facts in no way justify any autoist, whether novice or "old hand," from taking precautions in the shape of spare parts and tools against trouble of any nature. Before starting out on an extended tour at any time the box or bag devoted to spares should be examined and if any are defective, others should be substituted for them. The writer suggests the carrying of the following spares and tools in addition to the regular outfit as sufficient to cope with a large majority of roadside troubles: twine, tire tape, copper wire, spare springs for valves, rubber bands, hand vise, medium Stillson wrench, small blow torch, soldering iron and solder, brace and several drills, drift, cotton waste and a pair of gloves for working. Some of these are included in first-class kits but the autoist would do well to obtain them all as there is no telling when they will be needed to enable progress of any nature to be made.

With regard to the tools carried, there is no economy in cheap wrenches, files, etc., and sad to say, many tool-kits supplied with automobiles contain puny hammers, lead files and chisels whose edges are destroyed at the first stroke of the hammer. Such tools should be gotten rid of as soon as possible and others of well-known and tried makes put in their places. If the autoist is in doubt as to what make of file or wrench to purchase, any machine shop can give him satisfactory answers.

Interchangeable Valves Handy in Case of Breakage—An exhaust valve breakage was formerly a serious affair, as unless the autoist had a spare valve along, he was obliged to limp home on one cylinder when he had a two-cylinder motor, or be towed if the motor had but the one cylinder. Until recently, inlet and exhaust valves were of different sizes and could not be interchanged, but there have been comparatively few motors turned out in the last two years in which the valves are not of the same size. With motors having valves thus interchangeable, when an exhaust valve breaks and no spare valve is at hand, the inlet valve can be removed and put in place of the exhaust and the broken exhaust valve made to operate as an automatic inlet valve. In making all such interchanges, the valves must be ground in on their new seats.

When the Break Occurs Below the Guide—In many cases when the break occurs below the guide, the stem parts through the slot. To enable the valve to operate automatically a hole is bored in the stem or a slot filed in it in a radial direction. The slot and hole are for the attachment of retracting springs, two of which are shown in Figs. 1 and 2. In the first figure, A is a flat spring which works caliper-fashion in seating the valve, its upper end being fitted into a slot B filed or cut in the valve stem while the lower end is pierced to accommodate the lifter casing set-screw C. The "spring" in Fig. 2 is an elastic band A fastened to the screw at one end and to the valve at the other by means of a cord B passing through a hole drilled in the stem.

Weight of Valves Militates Against Easy Operation—In repairs such as the above, it must not be expected that the

valves will operate as well automatically as when mechanically operated. Valves intended for mechanical operation are made heavier than those designed to work automatically, and the increased weight militates against their easy operation. Retracting springs have to be sufficiently light to allow the valve to lift under the action of the suction, but not so powerful as to slam it back on the seat when suction ceases. With the arrangement in Fig. 2 other bands can be added in case the tension is not strong enough but in Fig. 1 tension can only be regulated to a certain degree by increasing or diminishing the "cup" of spring A. The shorter the valve stem, the lighter will be the valve and the more readily will it lift, it should be remembered. The time needed in effecting either of these repairs is about 15 minutes, not including the grinding in of the valve. With a single cylinder motor, the valve will work sufficiently well for the autoist to proceed to some place where a new valve can be obtained. With a two-cylinder motor, much time and annoyance will be saved as limping along on one cylinder is slow and by no means sure. In multi-cylinder motors difficulty will be experienced in having

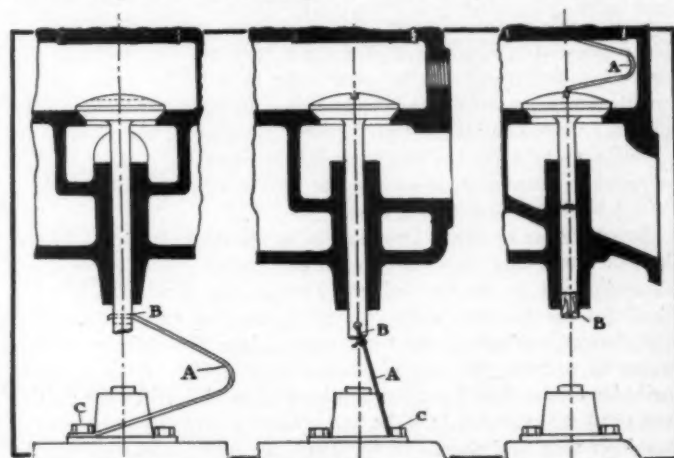


Fig. 1—Flat spring repair Fig. 2—Elastic band repair Fig. 3—Spring in the valve chamber
Utilizing Broken Mechanical Valve as an Automatic Valve

the "automatic" valve synchronize with the other mechanical valves but good progress is possible, nevertheless.

When the Break Is Within the Guide—In Fig. 3 is shown a repair when the stem is broken off in the guide. A spring A is placed within the valve chamber, one end in the slot in the valve head and the other bearing against the valve cap. The guide is plugged as at B to prevent air being sucked into the cylinder and weakening the mixture. Only in case of extremity should this repair be employed, as the spring will lose its temper or break and fall into the cylinder. It will, however, last a few miles, in some cases long enough for the car to reach a repair shop. In putting spring A in place, its upper end should bear off-center so that it will not be shot into the cylinder at the first suction stroke. If the requisite appliances are at hand, a hole can be tapped in the end of the stem and an arrangement of elastic bands like that in Fig. 2 attached to a screw set in the tapped hole. The plug in this case is to be left out.

A Practically Permanent Repair—Better and to all intent more permanent than the preceding when the break is at or above the slot, is the repair shown in Fig. 4. Provided there is sufficient space between the water-jacket and the broken end for the action of at least three spirals of a spring, this repair can be made to any mechanically-operated valve. A thread is formed on the stem at its lower end and two lock-nuts DD are screwed thereon, a flat washer E being put above the nuts to take the thrust of the spring. Spring C is cut off sufficiently to operate

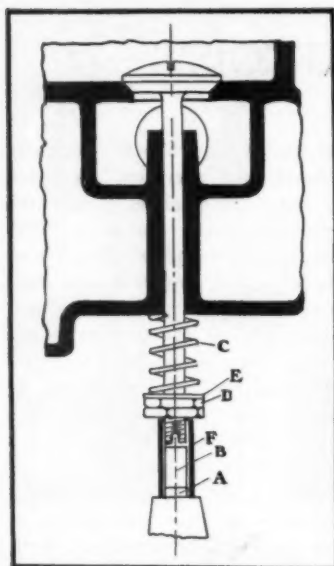


Fig. 4—Repair by insertion of filler piece

sary to effect this repair, die, lock-nuts, tubing and filler-piece are not often found in an autoist's tool-kit, so that the operation has usually to be performed in a repair shop. With steady attention to the work and the material at hand, thirty minutes should be all the time needed to complete the repair. In a similar way a broken mechanically-operated inlet valve can be adapted to automatic operation, the tubing F and the filler-piece B not being needed in this case.

Break Close to Head Impossible of Reliable Repair—There is little use trying to repair a valve broken off close to the head. A spring put in the valve-chamber as in Fig. 3 will be of very doubtful service and while it may return the valve to its seat the danger of having the head sucked into the cylinder is too great to warrant the use of such a make-shift. With a single cylinder motor therefore, the autoist will be obliged to lay up the car until a new valve is to be had. With a multi-cylinder motor the inlet manifold should be removed, the port of that particular blocked by means of a piece of cardboard, heavy paper or sheet gasketing, and the manifold replaced, care being taken in replacing that there will be no leak at the joints due to the extra thickness of gasket on the blocked cylinder. The spark plug should be taken out of the "dead" cylinder to allow the air compressed by the piston to escape freely. In motors where the inlet manifold is integral with the cylinder casting such as is the case with certain forms of "block" motors, the broken valve should be placed on the inlet side and prevented from lifting by a block of wood of sufficient length to keep it seated when the valve cap is screwed down.

When the Starting Crank Is Inoperative—On all cars with the motor in front the starting crank is permanently attached to the car, so that it is only necessary to push it inward against the action of a spring to engage the dogs with the pin on the extension of the crankshaft. This pin is subjected to considerable strain and sometimes breaks off, leaving the autoist to start the motor in some other manner. A method of starting which requires no extra appliances consists in jacking up one rear wheel of the car, and after engaging the high gear and letting in the clutch to turn the wheel strongly and rapidly in the forward direction. When the motor starts, which it will do with surprising ease, the clutch should be drawn, gear shifted to neutral and the wheel lowered to the ground. The car will then be ready to proceed. In some cases it will be necessary to set the hub brakes after the clutch is drawn, in order to stop the spinning of the jacked-up wheel.

Removing Broken Screws and Studs—Occasionally a screw or stud breaks off close due to too strenuous application of the

wrench or in a futile endeavor to start the refractory piece with a hammer. There is not enough of the broken end projecting in most cases on which a grip with the jaws of a pair of pliers can be obtained, so that one of the following methods must be employed to withdraw the stump of the screw. If possible, a slot may be cut in it for a screw driver, but the break is so often below the level of the part into which the screw is set that this cannot be done. This being the case, a hole should be drilled in the stump and the tang of a file inserted so that it bears against both the side and bottom of the hole. On rotating the file the stump will usually come out, especially if the threads have been treated with kerosene. If the stump refuses to move, the hole should be tapped with a left-hand thread and on screwing in a left-hand screw the broken piece will be drawn out. The employment of a left-hand flat drill in drilling the hole will often bring out the stump without the necessity of tapping. As a last resort, a hole of as large diameter as possible without injuring the threads should be bored through and the shell remaining chipped or cut out. It would be well to go over the threads of the part from which the screw was removed in this manner with a tap to correct any deformation caused by the chipping or cutting.

Substitutes for the Funnel—Autoists when starting on a tour should make sure that a funnel is included in the list of accessories accompanying the car. There are some autoists who never carry such useful articles on the ground that wherever gasoline is purchased a funnel will be supplied, so why carry anything that is not necessary? Anyone that has toured extensively in sections considerably removed from the larger cities, where garages are few and far between, knows the habits of country store-keepers, how one funnel is made to do duty in delivering molasses, water and oil as well as gasoline and is often given no better care than an occasional rinsing. The effect of foreign substances in the gasoline is well known and their effect on the action of the motor soon after their introduction into the fuel system will indicate their presence, so that an autoist who relies on gasoline delivered through unclean vessels is running chances of being laid up on the road and having to go through the tedious operation of cleansing the carburetor and perhaps the entire fuel system. One funnel at least should be carried, therefore, for use with gasoline and to insure cleanliness, this should be fitted with a strainer. A second funnel could be advantageously carried for filling the radiator, but the occasions when water is needed in the circulating system are so infrequent that this funnel is not absolutely necessary. However, if a funnel is not at hand when needed, the autoist can use an old envelope from which one corner has been torn, the envelope being held as in Fig. 4, where C is the opening made by the torn off corner. A handkerchief placed in the filling aperture will act as an efficient strainer, or still better a piece of chamois can be used. An excellent guide for pouring in liquid of any kind can be formed from a tire gaiter, squeezing one end so that the two sides form a channel sufficiently small to prevent slopping over the filling aperture.

It is of course understood that the gaiter is to be cleaned before being used for this purpose. Wrapping paper rolled into a cone, or a portion of an inner tube will also serve to conduct liquids in the absence of a funnel or a rubber hood formed into a trough can be used in emergencies.

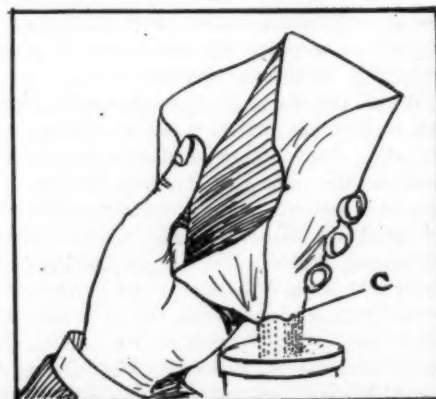


Fig. 5—Envelope used as a funnel



LETTERS INTERESTING AND INSTRUCTIVE



WHAT MAKES IT JUMP?

Editor THE AUTOMOBILE:

[1,921]—Will you please tell me through "Letters Interesting and Instructive" what makes my runabout, of a popular model, jump at times when running on the high gear, especially when the car is being run very slow. I have tried several things, such as valves, carburetor and commutator, but have not corrected it yet. I would like to have instructions as to how to time valves so as to get the best power results, also carburetor and commutator. Why does the engine get hot at times more than at others? Clio, S. C. A. B. WELCH.

The make of car which you are driving and having trouble with is equipped with a planetary transmission, which has a high-speed clutch. The jumping of which you speak might be due to some foreign substance on the surface of this, which prevented the clutch from engaging fully, yet allowed it to take hold sufficiently to drive the car. Then, after having driven the car for some distance, the obstruction was shaken out and the clutch took hold with a jerk, resulting in the jumping action of the car. This would explain the jumping of the car upon one or possibly two occasions, but not regularly, as it would be impossible to get obstructions into the clutch every day, as this would necessitate. You give so little information that it is hard to make out just what is the trouble.

As to the matter of instructions for timing valves, commutator, and remedying carburetor troubles, that is a rather large contract. You will find much to interest you and collect a great many pointers on the subjects spoken of if you read the following articles in the back numbers of THE AUTOMOBILE.

On Carburetors and Carburetor Troubles, Letter 1919, June 17 issue; Letter 1876, issue of May 13; Letter 1870, May 6 issue.

On Valve Timing, pages 897 to 899, June 3 issue; Letter 1901, June 3 issue; Letter 1883, May 20 issue (Offset crankshaft); Letter 1846, issue of April 22.

On Care of Valves, Letter 1889, May 27 issue; Letter 1869, May 6 issue.

On What to Do When the Carburetor Won't Work, pages 649 to 651, issue of April 22.

The engine may heat from a variety of reasons. The piston rings may be tight, the cylinder bore may be out of true, the water passages may be obstructed so that as much water does not reach the jackets as was intended, or faulty ignition or wrong carburetion may cause heating. A dirty cylinder oil may leave particles of dirt on the cylinder walls, which may cut and score the cylinder walls, thus causing heating. Then, too, the excessively high temperatures of the part of the country in which you are located may have something to do with the heating. If you

could be sure that the latter was the source of trouble, substituting a light oil for water in the jackets would remove any possibility of this heating ever doing any harm to your engine. This would not remove the source of trouble, but would restore your peace of mind, for you would then know that no harm could come from overheating, whereas at present this may result in your pistons seizing, with much consequent expense.

If you should ever have this happen, that is, the pistons seize, the best thing to do is to immediately squirt a lot of kerosene into the top of the cylinder in question. This is very thin bodied as compared to lubricating oil, and will work its way down between the cylinder and piston, thus releasing the latter. In so doing, it will also lubricate the walls, so that the piston will not seize again immediately.

If this does not release the pistons it will be necessary to take the engine out of the car and by a liberal use of more kerosene and much brute strength, extract the piston from the cylinder. It will then be necessary to dress the piston, rings and cylinder walls up before they may be used again with safety.

GAS TURBINE PROSPECTS

Editor THE AUTOMOBILE:

[1,922]—Will you please tell me something more about the power of a gas turbine? I have a steam turbine, which can be so arranged as to cool both the moving and stationary blades with water. Now, what I want to know is, does this kind of engine develop the power? The cut shown in the May 27 issue of "The Automobile" is of a turbine, the blades of which cannot be water-cooled as mine can. My engine is not patented, but I have a small model which runs very well with steam. Do you think that it would pay to experiment further with this kind of an engine? C. V. FITE.
Gastonia, N. C.

If your device has an arrangement which allows of cooling both the moving and stationary blades, you have made a big step in advance, as this is one of the most vexing problems which inventors in the past have tried unsuccessfully to solve.

Considering that the power is in the fuel, latent so to speak, it is only necessary to devise an efficient machine to transform this latent power into rotary motion, to make the turbine form a very powerful source or energy in a rotary form. Of the three great gas turbine problems, namely, speed, heating of blades resulting in their dissolution, and gas tightness without friction losses, you appear to have solved one, and it would be advisable to continue your work along the same line. This, too, in preference to following the line of steam turbines, already well supplied with efficient and very successful prime movers of the rotary type.

VALVES AND DEAD CENTER

Editor THE AUTOMOBILE:

[1,923]—I have read Mr. Fay's articles on setting motor valves, particularly the June 3 issue, with great interest, but it seems to me that one very important point has been omitted, viz: setting the crank on the center.

Also, I do not consider the method in answer No. 1,897, in the same issue, a perfect one, as when the crank is nearly on the center the movement of the piston is so very slight that the periphery of the balance wheel can be moved several degrees without an appreciable movement of the piston.

A much better method is to make a tram from a piece of stiff wire with about half an inch of one end bent at a right angle and sharpened. Let the wire be long enough to reach some part of the frame so that it can butt against it, but always in the same place, having the point approximately at the center of the upper surface of the balance wheel. Now put one crank about 45° before the center and mark on the balance wheel with tram point. Measure how far bottom of piston is from bottom of cylinder, then turn motor forward until piston comes back to same point in reference to cylinder bottom and make another mark on balance wheel with tram. Find the center between these two marks and this center point, when brought to tram point, will put the crank on the absolute center. The other center will be half way around the balance wheel. Preserve the wire tram and the motor can be put on its center at any time.

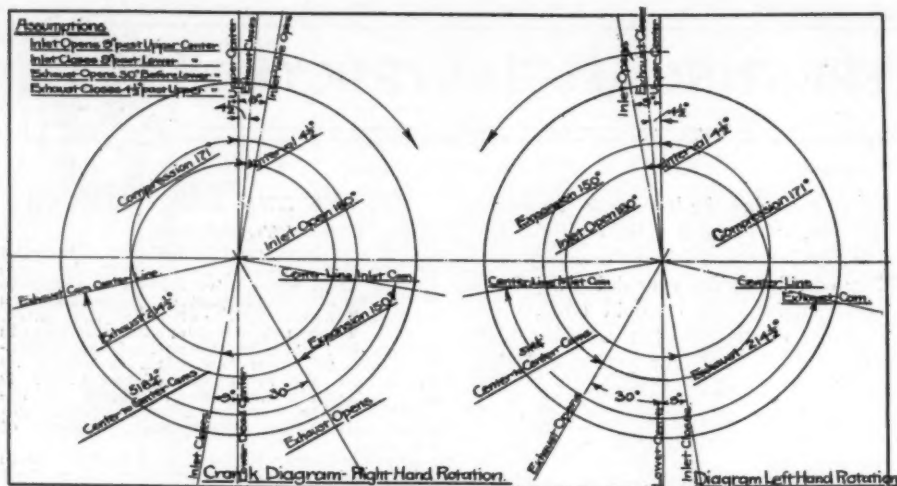
An easy way to find the opposite center is to take a strip of paper that will reach around the balance wheel and double, using one-half for a measure. W. W. TREVOR.
Lockport, N. Y.

Your criticisms are interesting, even though not just. The Fay article is not finished, and the matter of which you speak was not within the scope of that section. Later chapters may take up practical methods, such as setting the engine on the exact dead center, adjusting clearances, etc.

As to the letter, in which we presume that you have reference to No. 1,901, headed "Timing an Old Engine," rather than the one given by you, No. 1,897, which deals with, as the caption indicates, "The Subject of Weights."

In the former letter the subject of setting the engine on center was not discussed at any great length, because it was considered that nearly every one who could drive a car could also set the engine on center properly. Your answer raises the question that perhaps we were wrong in this assumption. It seems, however, as if the statement given in the answer to the letter in question, "carefully determine the upper and lower dead centers," covers the use and practice of any known method of doing this work in a manner which would come under the head of "carefully."

It might be well to call attention to one part of your remarks which would not come under this same head, and that is the last suggestion to find the opposite center by using a strip of paper which reaches clear around, folded in the center to measure half-way around. This would be far from an accurate method, and after determining the upper center by the careful and painstaking method given, it would be a



In Reversing an Engine, the Valve Diagram Must Be Completely Reversed

shame to spoil it by measuring around to the other center in the way mentioned. The circumference of an 18-inch flywheel is 56 1-2 inches. If a piece of paper as long as this will not stretch enough to throw away all of the accuracy of your former work we are very much mistaken. The proper way would be to take a steel tape, graduated into fine divisions, such as tenths and hundredths, measure the circumference, and then lay off half of that distance around in, say, a left-hand direction. Having done this, start around in a right-hand direction and lay it off again as a check. The measurements should agree exactly.

DETERMINING VALVE LIFT

Editor THE AUTOMOBILE:

[1,924]—Will you please give me a short empirical formula for figuring the lift of valves for automobile engines?
Cos Cob, Conn. SAM HEILMAN.

Having previously determined the valve diameter, bore, stroke, speed and valve seat angle, the area of the valve passages should be equal to the bore area times the stroke times the revolutions per minute, divided by the permissible speed, say 6,000 to 10,000 feet per minute. Then the valve lift should be equal to this passage area divided by the sine of the seat angle times the valve seat circumference.

HOW TO REVERSE AN ENGINE

Editor THE AUTOMOBILE:

[1,925]—Kindly inform me in the next issue of "The Automobile" if the following can be done: I have a two-cylinder, four-cycle automobile engine installed in a motor boat. This engine has the cams made integral with the camshaft. Now, I would like to run the engine in the opposite direction. Could it be done by changing the gears without having a new propeller wheel? The latter is a single casting, with right-hand blades cast integral. PIERRE LARIVIERE, Champlain, N. Y.

Even if you could run the engine in the reverse direction it would be necessary to get a new propeller wheel to run left handed. Granting that you wish to go to this expense, the next thing to do will be to secure the reversal of the engine.

This is a big job and one that should be approached with due caution. First, you will need a new camshaft. This you may obtain from the manufacturer, or if that is impossible, you can have all of the cams for either the inlet or exhaust turned off and new separate cams made. The latter can then be attached to the old shaft in the proper place longitudinally and circumferentially, the latter being by far the more important.

It will be necessary to determine the present angle between the inlet and exhaust cams and on the new shaft; set the cams at that same angle, but in the reverse direction. To assist you in this a

set of angles have been assumed, the two diagrams plotted, and the angles resolved into camshaft angles.

Two figures are given to help you. In the first, the valve diagrams are given for a supposed case, with the ordinary right-hand rotation, and also for the same case with left-hand rotation. Then in the second figure this latter diagram is resolved onto the cam diagram and the camshaft is shown as changed. To do this it was necessary to assume that the two cranks of your engine were set at 180 degrees apart and that you followed the suggestion made, to machine the inlet cams off from the present camshaft and make new ones to key on in their place, but properly located for left-hand rotation.

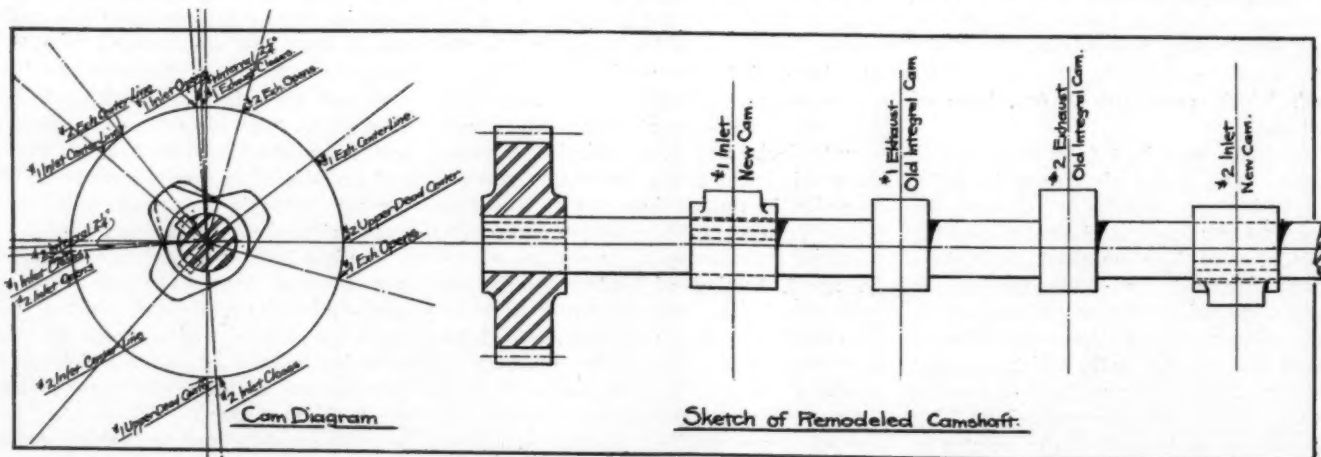
When all this has been done your work will be about half through, for it will be necessary to alter the timing of your ignition, whether that be battery, coil and timer or magneto. The former system is easier to change and this may be done by altering the setting and then changing the wires. With the magneto, however, it will be necessary to have an entirely new machine, these being built to run either right or left hand.

Then there will still be the pump. If this is a centrifugal pump it will be necessary to move it and insert another gear in the driving train so as to drive it in the same direction as at present, but with the engine running in the opposite direction.

If it is of the gear type no alterations will be necessary as these pumps are usually constructed so as to be reversible—that is, they work equally well both ways.

So, too, with the fan, lubricator and all other accessories they will have to be considered and such of them as are not reversible will have to be driven in a different manner. All told it seems as if the work and cost of this change more than offset any possible advantage to be gained from the rotation in the opposite direction.

Editor's Note—Will W. H. S., New York City, whose letter was published in the June 10 issue of THE AUTOMOBILE, kindly send his address to this office?



The Reversed Valve Diagram Applied to the Camshaft, and the Remodeled Shaft When Completed, with Two New Cams In Place

DESIGN OF KNUCKLE JOINT FOR TRANSMISSION*

By RUDOLF THUROW, M.E., CHARLOTTENBURG

THE absolute freedom of relative motion necessary between the motor and the gearbox of an automobile, where these two essentials are separate units, is usually accomplished by means of the interposition of the effective but costly universal joint. A more economical form of coupling is to be found in a knuckle type of joint or link, each end of which is inserted in a recess in the shafts, as shown in Figs. 1 and 2. The chief question about the design of such a joint is the determination of the size of the surfaces in contact and the

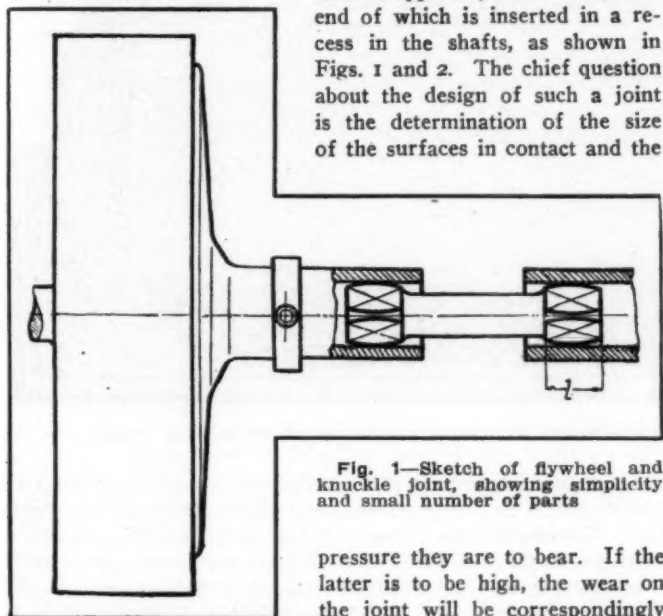


Fig. 1—Sketch of flywheel and knuckle joint, showing simplicity and small number of parts

pressure they are to bear. If the latter is to be high, the wear on the joint will be correspondingly rapid, while the stronger it is made in this respect, the more sudden and jerky will be the coupling in action. The entire turning moment of the motor will then be transmitted directly through the parts of the knuckle, which means that the parts will have to be proportioned with this idea in view.

This gives the relation:

$$N_e = \frac{Pv}{75} \quad (1)$$

The efficiency of the motor:

$$\text{The speed } v \text{ in meters per second} = \frac{2\pi n}{60} \quad (2)$$

$$N_e = \frac{\pi \cdot 0.8 \text{ of the } Pr 2\pi n}{60 \times 75} \quad (3)$$

Therefore it follows:

$$Md = \frac{N_e 60 \times 75}{2\pi n} \quad (4)$$

In the knuckle joint, shown in Fig. 3, with a rectangular cross-section, the turning moment must be carried on four faces:

Consequently:

$$Md = 4P'r' \quad (5)$$

or:

$$P' = \frac{Md}{4r'} \quad (6)$$

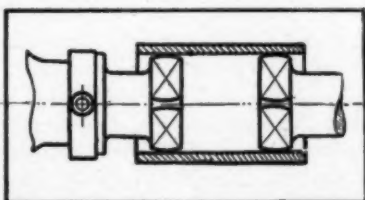


Fig. 2—Enlarged view of joint

In actual practice, however, these stresses must be carried on about one-third of the surface in question, so that this reduces to:

$$P' = \frac{l}{3} b \quad (7)$$

l is the length of the bearing surface, so it must be:

$$P' = \frac{b}{3} \times \frac{l}{2} k \quad (8)$$

k represents the permissible deflection in kg/cm^2 .

With a special automobile steel of good quality, it may be given a value of $k = kg/cm^2$.

For the knuckle link in question it may reach:

$$NC 4 I od \frac{C 46 O}{s} od K S 72 \quad (9)$$

But owing to the excessive stresses that will frequently occur and the resultant destructive effects upon the surfaces, it may often be considered expedient to employ more than four surfaces to transmit a certain amount of power. This brings us to the hexagonal cross-section illustrated by Fig. 4.

The equation is then:

$$P' = \frac{Md}{4r'} \quad (10)$$

and it may reach:

$$P' = \frac{Md}{6r'} \quad (11)$$

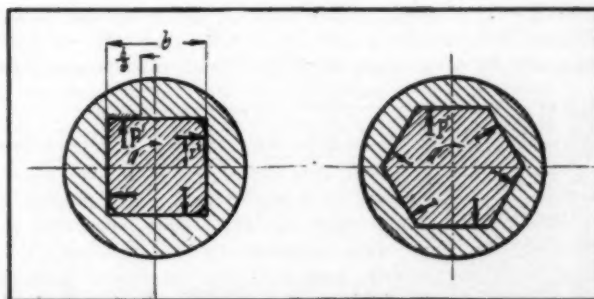


Fig. 3—Square type

Fig. 4—Hexagonal type

Knuckle Joints Shown in Sectional Form

It will then follow that the pressure on the surfaces k will amount to but two-thirds of the value previously given, and it will hold that:

$$k : k' = \frac{1}{4} : \frac{1}{6} \quad (12)$$

and consequently:

$$k' = \frac{2}{3} k \quad (13)$$

The relation of the bearing surfaces in the hexagonal section is also much more favorable, but the six-sided construction naturally costs more. Practice alone can be looked to to determine the relative values of the square and hexagonal types.

Additional types are created by the extension of the number of faces to octagonal and higher forms, all of which present new problems to be solved. In the extreme this reaches the form of a gear meshing into another gear of the internal type. In practice this form is used with 12, 14 or 16 teeth, the number used depending upon local conditions, such as the allowable external diameter. So, also, with the width of the face.

*Translated from the German, by C. B. Hayward.



Hubert Latham, the English Aeronaut, with Antoinette Aeroplane, Breaking Monoplane Flight Record, at Chalons, France

PARIS, June 16—The present French aeroplane champion is an Englishman, who has succeeded, on an Antoinette aeroplane, in beating the record held by a Frenchman on an American flyer. Hubert Latham climbed into his Antoinette monoplane at Chalons a little before seven o'clock in the evening and did not settle down again until 1 hour 7 minutes 37 seconds later, having broken all records made in France with the exception of those of Wilbur Wright. First place in the flying world—excluding Wright, who is looked upon as unbeatable—had been occupied by Paul Tissandier, who remained in the air 1 hour 3 minutes on Wilbur Wright's old flyer.

Hubert Latham is a newcomer who purchased an Antoinette monoplane and took his first flying lessons about two months ago. Less than a fortnight ago he won the Aero Club prize for a flight of 500 yards, this being his first really important performance. This has been followed up by a flight of 37 minutes accomplished with such ease that on several occasions the pilot raised his hands from the steering wheels to take his cigarette from his lips. A steady breeze was blowing at the rate of 8 miles an hour when the start was made for the long distance record. After running 100 yards on the ground the

machine rose into the air at a speed of 55 miles an hour, and at an altitude of 50 feet described huge circles over the vast plain. Later the height was increased to 130 feet, the flying machine passing over the tall poplar trees lining the military ground with a respectable margin of safety. When a descent was finally decided upon dusk had settled down and a drizzling rain had made it almost impossible for the pilot to pick out his course.

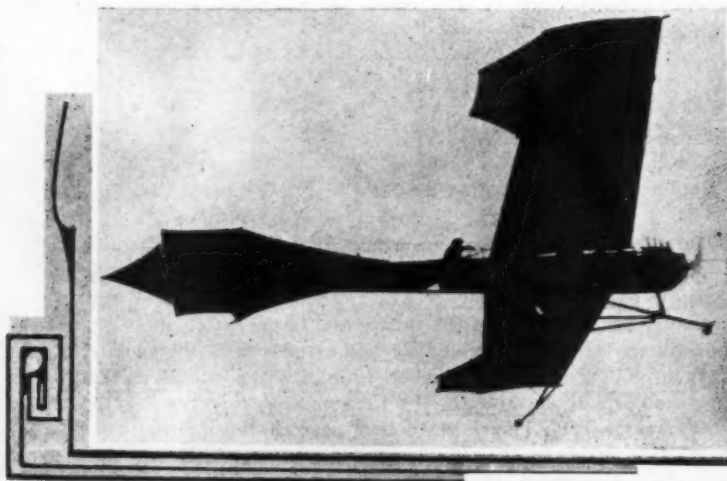
The long distance flight was followed by the winning of the Goupy prize for a flight of not less than five kilometers away from a specially prepared aerodrome or operating ground. Members of the Aero Club measured a straightaway course across country, planted a flag five kilometers out and sent the aeroplane away. There were telegraph wires, a village and poplar trees rising to a height of nearly two hundred feet, with the result that it was necessary for Latham to soar to a great altitude in order to be free from collision. Running at nearly 50 miles an hour, the aeroplane soared over the village of Cuperly, the inhabitants of which greeted him with shouts of delight, rounded the flag in 4 minutes 13 seconds, and after a very wide detour settled down at his starting point, having been in the air altogether no less than 14 minutes.

Captain Burgeat, also an Antoinette pilot, was next taken up as a passenger and carried for a distance of 800 yards; three others followed, the longest flight with a passenger lasting 11 minutes 56 seconds.

RHEIMS AERO COURSE PREPARATIONS

PARIS, June 10—The Gordon Bennett and other aeronautical races to be run during the Rheims week, August 22 to 29, will take place round a specially prepared course marked out by four posts, each 60 feet in height, and painted bright red and blue in order to be clearly visible. Two sides of the course each measure 2.1 miles, while the two short lengths are just a fraction under a mile. The flying ground on which this special course is laid off will be entirely enclosed by a stout barricade having a circumference of over six miles, the spectators being massed behind the barricade, in which position they will be able to see perfectly, but will be unable to invade the ground reserved to the flyers.

It is expected that King Alfonso of Spain will be a spectator at the flights, a large house in the neighborhood of Rheims having been rented for his use during the month of August.



A Closer View of Latham's Bird of Flight

DAYTON HAS BIG WRIGHT CELEBRATION

Dayton, O., last week lionized the Wright Brothers, if such a term can be applied to those who imitate birds, and the nation and State had a very significant part in the celebration. But in interesting contrast to the wide enthusiasm exhibited by their home city, was the modesty of the two men whom it delighted Dayton to honor. Speeches have never been in the line of flying, but the whole world was startled by the fact that only four words were spoken by each on the first day of Dayton's jubilee, and on the next day when valuable medals were presented, Orville Wright said one sentence of seventeen words, and Wilbur spoke probably two minutes. Yet none the less were the honors heaped upon them. Thursday and Friday were set apart for the commemoration holidays for the city, and there were parades, dinners, a reception and a fireworks display to show the heartiness of the feeling, but at the same time the "Wright Aeroplane Factory" was working at nearly full force, perhaps the only one in the city doing so, and the two famous aviators spent several hours in it.

Triumphal arches spanned the main streets, American flags and bunting were everywhere in evidence, a martial air was instilled by the presence of national and State troops, and brass bands could be heard throughout the two days. On Thursday, at 9 o'clock every bell and whistle in the city blew for ten minutes, attracting the attention of the Wright Brothers, who were in their shops, so that they went out on the street in their shirt-sleeves to learn the cause of the commotion, and at 10 o'clock they were taken to the opening ceremony of the "Homecoming celebration." There was an item on the program from which something of interest was expected. It read "Responses by the Wrights," and there was something of wide interest therein, for each brother arose and said, "I thank you, gentlemen."

Nation, State and city paid tribute to the inventors on Friday when they were given the gold medals authorized by Congress from the United States, a diamond-studded medal bearing the official seal of the State of Ohio, and another from Dayton. Governor Harmon addressed the multitude for the Commonwealth; Gen. James Allen, Chief Signal Officer of the Army, for

the Government, and Mayor E. E. Burkhardt for the city. An international flavor was lent by the presence of Japanese Ambassador Baron Kogoro Takahira and Cuban Minister Carlos G. Velez. In answer to the speeches, Orville Wright said: "I wish our work was commensurate with the honors that have been heaped upon us. Thank you." Wilbur Wright found a happy topic and made a short, very short, speech. When the medals were given to the brothers they turned them over to Miss Katherine, the sister, who helped the boys in the earlier days of their work. Bishop Wright, the father, participated in the ceremonies.

The Wright aeroplane which will be used by Orville in the Government tests at Fort Meyer is already upon the scene. By June 28 it must pass the two tests in order to secure the \$25,000 offered, one to fly five miles straightaway and return with a passenger, and the other to fly at least one hour with a passenger at a minimum rate of 36 miles per hour.

KIMBALL'S BIG AEROPLANE WRECKED

NEW YORK, June 21—So badly was the big eight-propeller aeroplane of Wilbur R. Kimball injured at the old Morris Park grounds by striking a bank near the south turn that it may not be repaired. Mr. Kimball was making a trial with the machine, and after running the biplane up and down the track to tune up the motor, he started to see if it would rise, but he was evidently so intent upon operating the engine that he did not notice a swerving of the aeroplane. At the beginning of the turn the end of the big plane struck the bank and crumpled like an egg shell, forcing the machine violently around, and overflowing gasoline caught fire but was extinguished. Both frames were badly cracked, and some of the propellers broken, the front and side wheels smashed, and the controlling system deranged.

Glenn H. Curtiss made two flights on last Friday, in one of which it is claimed that he attained a speed of 46.7 miles per hour in a distance of about of about a hundred yards. In another his speed was 26 miles an hour over a distance of 99 yards, in which he tried to go as slowly as permissible with maintaining equilibrium. The tests will be continued for some days.



How Dayton, Ohio, Was Bedecked During the Ceremonies of June 17-18, in Honor of the Homecoming of the Wright Brothers



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IF WE ONLY HAD THE TIME

What is the matter with the American manufacturer? Five and more years ago an American invented, built, and partly perfected a slide valve engine. Laughed at and repulsed, he went abroad. There he received support and the new motor was still farther perfected, and later put on the market. With the latter step came the necessary publicity to bring it before the public, which resulted in some doubts as to its real ability. This having been proven beyond the hopes of the most sanguine friends, all of Europe devoted to automobiles has taken up the sliding valve idea. Many manufacturers are building under license to the American inventor, and as many more are at work on similar devices beyond the scope of the patent. While this has stirred up the subject of valves, much work is also being done on rotary valves and much investigation is being conducted, to shed light on the complex subject of the introduction of the gaseous charge into the cylinder, and after combustion, its removal therefrom. In the meantime, the American manufacturers appear to plod contentedly along in the same old way, using the same old valves, and never giving a thought to finding anything different.

So, too, with spring wheels; in England and in France much experimentation is in progress, with the object of solving the combination problem of wheels and tires. These experiments may not have produced a perfect resilient wheel, the use of which would send all air-filled

tires into oblivion, but at any rate they will result in some progress in this direction, and a more intelligent grasp of the subject.

In England, at present, there is going on a spirited discussion of the merits and demerits of front wheel brakes. This follows their adoption and use on a number of first-class cars. As this adoption and use is but the result of many months of construction and tests, it follows logically that the English manufacturers must have started work along these lines upwards of half a year ago, and possibly as long as a year ago. When we then admit that nothing is being done with the matter of front brakes on this side—whether these are good, bad, or indifferent—is it not equivalent to the admission that we are from a half year to a year behind the times? In so far as the goodness or badness of this particular device has never been publicly proven nor disproven, so that it is still but a matter of conjecture, we can in this case save ourselves and our self-respect by condemning it.

But in the long run that way will not always answer, for it is not possible to gain the front rank by crying down new devices as bad simply because their goodness has not yet been proven conclusively.



TWO SIDES TO EVERY QUESTION

In the course of a well-written editorial headed "Rules of the Road," the Buffalo Express sums up the situation with the following paragraph:

Let's keep the automobile in its place, but don't forget that there are other offenders, that there are other unenforced laws, besides those which apply to motor vehicles. Perhaps the world would be happier if it did not rush about so in devil wagons, but common sense can be applied even to this proposition. A class gets its reputation from its worst members, but the fact remains that there are good automobilists and bad and that the good far outnumber the bad. Let's have reasonable laws, applying to all classes, and let's have them enforced. Make an example of the fellow who blinds you with his car or causes it to emit unnecessary noises and smells, and look to the quiet, decent user of the automobile to applaud and sustain the effort.

Previous to its summation of the matter, the Express refers to the fact that it is undeniable that speed laws are violated; that some chauffeurs drive "as if the devil were after them—or sitting at their elbows;" that dripping-pans are emptied too often; that poor drivers use the "cut-out" too much, and that the use of acetylene lamps in city streets is abusive.

A great many automobilists do not so offend, states the Express, which then proceeds to tell of the unfair treatment to which the driver of the motor-driven vehicle is subjected in one way or another. Reference is made to the suburban trolley with its blazing headlights; the unilluminated wagon and carriage of the horse-drawn variety, and the necessitated dodging of the careless cyclist, though the absorbed pedestrian who walks across the road in a trance is forgotten.

Certainly it is gratifying these days to note the common-sense attitude of the enlightened daily press. Time was when the automobile came in for a more or less general denunciation in a majority of daily and weekly newspapers. Gradually, and now very perceptibly, with increase in numbers automobilists comprise all classes, where once they consisted principally of a select few of discerning enthusiasts who simply took to the motor-driven vehicle in advance of the others, and at the same time thus financially helped the makers through the period of experimentation.

WHY THE PARIS SALON HAS BEEN ABANDONED

PARIS, June 16—There will be no Automobile Salon in Paris this year, and for the first time since it was built the magnificent Grand Palais, in the Champs-Élysées, will remain empty and deserted during the months of November and December. For eleven successive years the Paris automobile show has been a feature, growing in size and influence until it was by far the most important industrial and social event that the city possessed. The Artists' Salon, the Horse Show and a few others occupied the same hall during a portion of each year, and succeeded in attracting no small amount of attention; but not one of them had the same amount of éclat as the automobile exhibition, and all combined did not arouse the same interest in all classes of the French public as the display of mechanically-driven vehicles.

In their desire to make it the most world-stunning exhibition of the year, the organizers of the Paris Salon have overshot the mark. Changes in automobile design having become less and less during the past four years, there was lessened necessity for an automobile exhibition. Added to this that the country had no longer any need to be converted to a mode of locomotion towards which it had been favorably inclined from the beginning; that the display was a most costly affair for the manufacturers; that the profits went to a body of men not directly engaged in the industry—all this considered, and it is not surprising that the annual Paris Salon has had to go by the board. It should be added that there will be another one in 1910, but it would be too much to say that it will be on the same lines as those of the past.

When the first purely automobile show—an offshoot of a cycle exhibition—was held in Paris in 1897 the Automobile Club of France undertook the lion's share of the responsibility and the labor. As the industry grew, three trade associations joined the club, and of recent years the annual exhibition has been organized by a special joint committee formed by the Automobile Club of France, which appointed its delegate, Gustave Rives, as general manager, and took 50 per cent. of the profits; the Chambre Syndicale de l'Automobile, allowed 20 per cent. of the profits; the Chambre Syndicale du Cycle et l'Automobile, also entitled to 20 per cent., and the Union of Cycle Manufacturers taking 10 per cent. of the profits. The tire manufacturers, some of whom had individually greater trading interests than the whole of the cycle makers combined, had no share in the show; while the important section of body builders—more important here than

in other countries, owing to the separation of the industries—was also unrepresented on the organizing committee. The Automobile Club of France, more closely connected with the sporting than the business section of the automobile, was given an importance equal to that of the whole of the manufacturers, while the actual exhibitors had to pay in to them thousands of dollars in entrance fees and an equal sum in general expenses to maintain the high standard of the show. Naturally the club sought to continue this state of affairs, for the show allowed it to net the respectable sum of about \$10,000 per annum.

The first to break away was the Chambre Syndicale du Cycle et de l'Automobile, which drove out its pro-Salon committee, put M. Darracq at its head and voted unanimously against a show next year. The Automobile Club of France and the Cycle Manufacturers took up the opposite position, while the Chambre Syndicale de l'Automobile, which is very closely connected with the club, having its offices in the same building, appeared to hesitate. The Marquis de Dion, president of the Chambre, was strongly in favor of a show, and although his committee a few weeks ago voted for abandonment, the vote had to be ratified by a full meeting of the members. The battle took place this week, and after several hours' fierce fighting the anti-show group got the upper hand, the vote being 79 against the holding of a show, 28 in its favor, and 3 blank papers. In face of such a vote it is, of course, impossible for the club to think of throwing open the doors of the Grand Palais this year. The manufacturers voted on principle in favor of a show in 1910, but nothing was decided as to the bases on which it will be held. There is every possibility that the old conditions will be changed and that the manufacturers' share in the profits will be very much larger than it has been in the past. The system, too, of allotting the best positions to the oldest established French firms, or those having been most successful in speed tests will also be swept away, the result of such a system being to give to the early firms an importance in the eyes of the public which they have, industrially speaking, in many cases long ceased to occupy. The manufacturers are, for the most part, in favor of drawing of lots for the whole of the show spaces, or in lieu of that of admitting all firms producing a certain number of cars per annum to draw for positions in the center of the hall, irrespective of nationality or date of origin. Either one of these propositions seems equally fair to all concerned.

ONE-LUNGER WINS FRENCH VOITURETTE RACE AT BOULOGNE

BOULOGNE SUR MER, June 20—Giuppone, driving a single-cylinder Lion-Peugeot, to-day won the fifth annual race of the Coupe des Voiturettes, held on the Boulogne circuit, covering the 28.5 miles in five hours and 56 minutes, averaging a speed of 47.5 miles per hour. Goux, in a car of the same make with two cylinders, finished second, while Thomas, in a single-cylinder Le Gui, was third. Boillot, in another one-cylinder Lion-Peugeot, was fourth, this firm thereby making the best team performance. Pilliverde, Zuccarelli, and Derny, each driving four-cylinder Hispano-Suiza cars, took fifth, sixth, and seventh positions, a remarkably good display. Two English Calthorpe machines, of four cylinders, driven by Porter and Burgess, respectively, finished eighth and ninth. There were twenty-one starters and eleven were eliminated through mechanical defects during the course of the event.

A heavy fog necessitated an hour delay in the morning at the start, and even when the machines were sent away, in France's only speed contest of the year, the drivers could see but about 500 yards. Later the mist lifted and magnificent weather pre-

vailed. The only mishap of the day was the overturning of Farcy's single-cylinder Crespelle machine, which took fire and was almost entirely destroyed. There were twelve rounds to be covered and after the first three were completed the interest centered in the competition between the Lion-Peugeot and the Hispano-Suiza, the former of which was the faster make, and after half the race was completed, there was no doubt of the finish, barring accidents.

A method of treating the course with calcium chloride, instead of oil, was the greatest success, there being no dust, and none of the participants stopped to have their eyes treated.

OPEL WINS PRINCE HENRY TOUR

BERLIN, June 17—Germany's premier touring contest, the Prince Henry competition, was won by Wilhelm Opel in an Opel car, with Willie Poege second in a Mercedes. Of these two makes in the event there were 16 Opels and 8 Mercedes. The course was 1,132 miles in length.



The Crowd That Lined Readville's Historic Course, on Bunker Hill Day, to Witness the Auto Races

BOSTON, June 21—Bay State Automobile Association and Readville track have long had reputations as the sponsor and site of some of the best automobile track race meetings in the country, but all previous successes were eclipsed on Thursday. A new world's record of 23:35 for twenty-five miles by DePalma; a new record for the track of 54 seconds by the same driver; almost total absence of tedious delays and accidents, races won by a wheel, and keen competition all the way through, were some of the features that entertained the large crowd for four hours and sent them home well satisfied. Even tire trouble did not interfere materially with the races, the absence of punctures being remarkable, considering the high speed that was made in almost every one of the eight events on the program. The weather was ideal and the number of automobiles along the home-stretch and within the track was very large. The races were under the able management of Chester I. Campbell, manager of Boston's automobile shows, and his associates on the committee were V. A. Charles, C. J. Bailey, Frank E. Wing, W. C. Schmunk and James Fortescue.

DePalma was easily the star of the meet. Next to DePalma the honors went to Lorimer with the Chalmers-Detroit, who gave the former a long and hard tussle in the Harvard trophy race, making him push his car to the limit, and he captured the second most important event, the contest at ten miles for the Automobile Trade trophy.

The Harvard trophy event was a free-for-all, the winner taking the magnificent trophy and \$500 in cash, second car winning \$200, and third car \$100. It was run in two preliminary heats at five miles and a final at twenty-five miles. In the final the cars were the Fiat, Chalmers, Detroit, Alco, Renault, and Allen-Kingston. DePalma got the lead at the start and was never headed. The first mile the Alco was second and then it was passed by the Chalmers. At the end of five miles it had developed into two contests, the Fiat and Chalmers-Detroit fighting for first place and the Alco and Renault having it out for third position. At ten miles the first two cars, racing close together, were a quarter mile ahead of the second two, with the Allen-Kingston nearly a lap behind. At fifteen miles the Fiat led by an eighth of a mile over the Chalmers and by a half mile over the Alco, three-quarters over the Renault and more than a lap over the Allen-Kingston. The positions remained about the same until the twentieth mile, when the Alco had tire trouble and dropped into fourth place, the Renault going up into second. Then began some of the finest driving ever seen at Readville. Closely pursued by Lorimer, DePalma let out to the last notch and whirled around the track

scarcely raising the dust, so neatly did he take the corners. In the twentieth mile he lapped the Alco and in the twenty-fourth the Chalmers. His time was 23:25 and he was given a rousing reception by the crowd when he came back to the stand and it had been announced that a new world's record had just been made.

In the Automobile Trade trophy race at ten miles for stripped stock cars chassis over 36-horsepower there were seven entries and all came to the tape. They were two Allen-Kingstons driven by Glenworth and Hughes, Knox driven by Basle, Welch driven by S. L. Rogers, Alco driven by Grant, Stoddard-Dayton driven by B. W. Shaw and Chalmers-Detroit driven by Lorimer. The first eight miles were a duel between the Chalmers-Detroit and the Alco, the Alco leading for the first mile and then the Chalmers going to the fore. In the ninth mile, however, the Alco had trouble and the Stoddard-Dayton went up to contest with the Chalmers-Detroit for supremacy. Lorimer, however, had the race well in hand and won in 9:46 1-5, by about five-eighths of a mile over the Stoddard-Dayton. The Allen-Kingston driven by Hughes was third, the other Allen-Kingston fourth, and the Welch fifth.

By all odds the most exciting finish of the day was in the five mile-race for roadsters and runabouts of 31-horsepower and over, for the Knowles cup. There were two preliminary heats and a final. The Allen-Kingston, driven by Glenworth, won the first heat in 5:17, with the American Roadster, driven by A. J. Andrews, second; and the Chalmers-Detroit, driven by F. F. Cameron, third. In the second heat Hughes's Allen-Kingston dropped out, and the other two cars were stopped at the end of the third mile, both qualifying for the final. In the final were the Stoddard-Dayton, Allen-Kingston, Chalmers-Detroit and Welch. The Stoddard-Dayton cut out the pace for four miles, having a good lead with the other three bunched. Then it had trouble and the others closed up and the final mile was as pretty a contest as is often seen at an automobile meet. Coming into the head of the stretch to the tape all the cars were bunched like a lot of running horses. Here Rogers showed the reserve power in his Welch and letting it out a notch shot to the front and went under the wire a matter of a few feet ahead of the Allen-Kingston, with the Chalmers a close third and the Stoddard-Dayton fourth. The time was 5:16.

The races opened with the amateur event of five miles with four starters, the Welch driven by A. W. Merriam, Chalmers-Detroit driven by C. S. Hall, Buick driven by Ryall, and Stoddard-Dayton driven by Shaw. The Stoddard-Dayton won in 5:21, with about a quarter mile to the good over the Welch.

DePalma's mile trials and his match with Basle followed, and then Harry Grant with the Alco, and Hugh Hughes with the Allen-Kingston were sent five miles in a match, Grant winning in 5:6 1-5. It was a close race all the way. A five-mile race for touring cars was awarded to the Midland, which was the only touring car that started, the Jackson which made the distance in 6:04 3-5 being declared a runabout and the Buick dropping out. The three-mile race for roadsters and runabouts up to 30-horsepower had three starters, a Columbia driven by J. J. Coffey, a Chalmers-Detroit Thirty, driven by F. F. Cameron, and a Buick driven by James B. Ryall. The Buick was early out of the going and the Columbia had little trouble in winning over the Chalmers-Detroit in 3:38 with a quarter mile to the good. The only accidents of the day were minor in character, two racing cars catching fire apparently from back-firing. These incidents caused some excitement but little damage. The summary:

5 MILES FOR BAILEY TROPHY, AMATEUR DRIVERS

Car	H.P.	Driver	Time
1 Stoddard-Dayton ...	60	B. W. Shaw.....	5:21
2 Welch	70	A. W. Merriam....	
3 Buick	30	J. B. Ryall.....	

SPECIAL TRIALS TO BEAT TRACK RECORD OF :54 2-5

1 Fiat	R. DePalma	:54 1-5 & :54
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25 MILES FOR HARVARD TROPHY, OPEN TO ALL

First Prize Trophy, and \$500; Second Prize, \$200; Third Prize, \$100

First Heat at 5 Miles:

1 Fiat	60	R. DePalma	4:54 4-5
2 Chalmers-Detroit ...	40	L. B. Lorimer.....	
3 Alco	60	H. F. Grant.....	

Second Heat at 5 Miles:

1 Stoddard-Dayton ...	60	B. W. Shaw.....	5:6 3-5
2 Allen Kingston.....	48	C. A. Glenworth...	
3 Renault	60	C. Basle	

Final Heat, 25 Miles:

1 Fiat	60	R. DePalma.....	*23:35
2 Chalmers-Detroit ...	40	L. B. Lorimer.....	
3 Renault	60	C. Basle	

*New world's record.

5 MILES SPECIAL MATCH RACE

1 Alco	60	H. F. Grant.....	5:6 1-5
2 Allen Kingston	48	H. Hughes	

5 MILES FOR TOURING CARS UP TO AND INCLUDING 36-H.P.

1 Midland	Jackson	6:4 3-5
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(Disqualified for not having equipment according to specifications; protested).

10 MILES FOR AUTOMOBILE TRADE TROPHY FOR STRIPPED STOCK CAR CHASSIS OVER 36-HORSEPOWER

1 Chalmers-Detroit ...	40	L. B. Lorimer.....	9:46 1-5
2 Stoddard-Dayton ...	60	B. W. Shaw.....	
3 Allen-Kingston	48	C. A. Glenworth...	

3 MILES FOR STOCK ROADSTERS UP TO 30-HORSEPOWER FOR THOMAS TAXICAB TROPHY

1 Columbia	24-30	J. J. Coffey.....	3:38
2 Chalmers-Detroit ...	24-30	F. F. Cameron.....	

5 MILES FOR ROADSTERS AND RUNABOUTS, 31-HORSE-POWER AND OVER, KNOWLES CUP

First Heat:

1 Allen-Kingston	48	C. A. Glenworth...	5:17
2 American	50	A. J. Andrews.....	
3 Chalmers-Detroit ...	40	F. F. Cameron.....	

Second Heat:

1 Stoddard-Dayton ...	60	B. W. Shaw.....	None taken.
2 Welch	70	S. L. Rogers.....	

Final Heat:

1 Welsh	70	S. L. Rogers.....	5:16
2 Allen-Kingston	48	C. A. Glenworth...	
3 Chalmers-Detroit ...	40	F. F. Cameron.....	

25 MILES SPECIAL MATCH

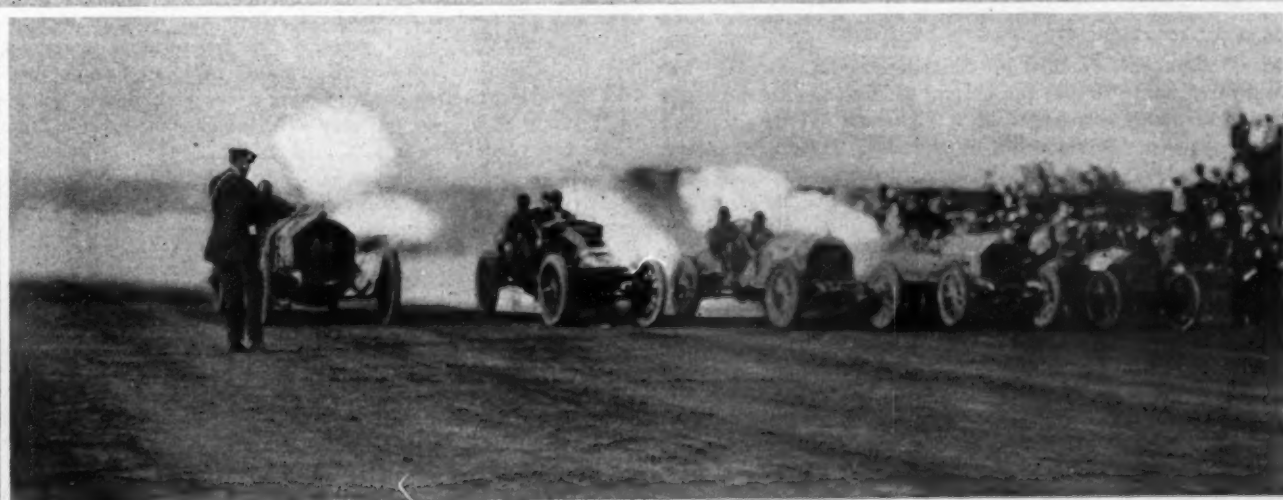
1 Fiat	60	R. DePalma	24:39 2-5
2 Renault	60	C. Basle	

SHERMAN SETS TIME FOR CAPITAL RUN

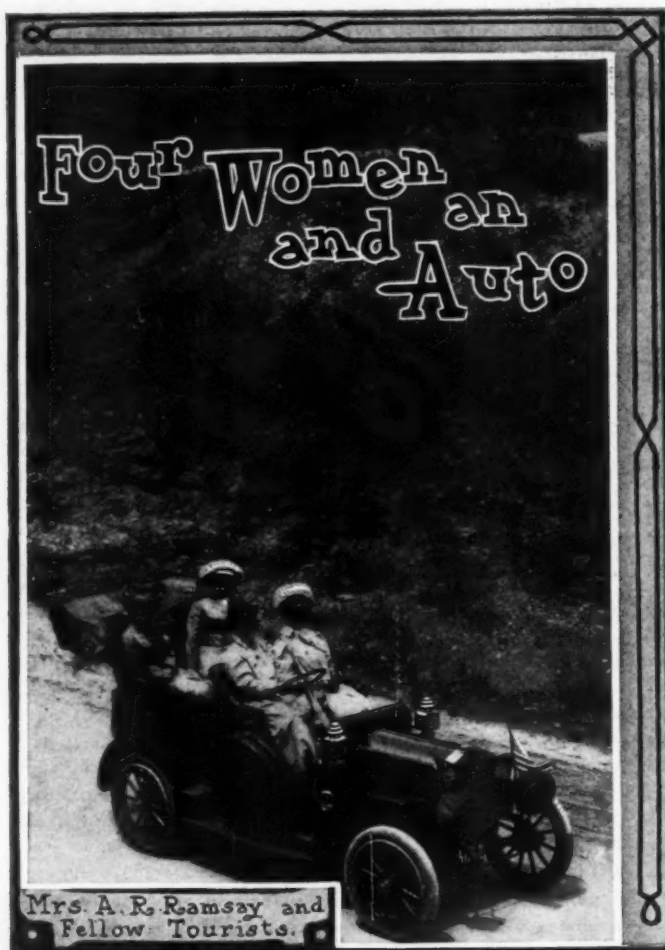
WASHINGTON, D. C., June 21—With the Vice-President of the United States to set the secret official time, the automobilists of this city yesterday participated in a sociability run to Great Falls, a distance of 16.3 miles. The affair was promoted by the *Washington Times*, and was designed to show that automobiles could be driven over the conduit road (one of the most tempting stretches of road in this country) without the drivers becoming imbued with the racing mania. In this respect, as in all others, the run was a pronounced success, and proved to be the greatest automobile event ever given here. In setting the time, which remained sealed until after the contestants returned to the starting point, Vice-President Sherman said he was well aware that the run could be made in very much less time than he fixed. He went on to say that he fixed the time on the theory of encouraging, rather than discouraging compliance with the law. Upon this theory he thought the run ought to be made in 54:07.

There were 74 contestants in the run. Curiously enough it remained for a Thomas taxicab, driven by H. M. Miller, a public chauffeur, to nearest approach the secret time. He covered the 16.3 miles in 54:13 4-5, just 6:4-5 behind the official time. A Baker electric, driven by John Bartrem, won second place, his time being 54:24 2-5. R. P. Andrews, in a Chalmers-Detroit, was third, the time being 53:48, while another Baker, piloted by G. A. Weaver, won fourth prize. His time was 54:28. Miss Lillian Miller, a sixteen-year-old girl, captured the fifth prize in a Ford, her time being 54:38 3-5. There were twenty-one prizes in all.

The weather conditions were ideal, and the run attracted much attention, thousands of people being at the starting point. They returned five hours later to hear the returns read, and kept a big detail of police busy holding them in check.



Start of the 25-Mile Free-for-All, at Readville Track, in Which DePalma Drove a Record Victory



CHICAGO, June 21—"We have had a most enjoyable time so far," said Mrs. Alice R. Ramsey, when she and her party arrived in Chicago en route for San Francisco in a Maxwell car. "So far it has been perfectly lovely and we feel certain that the remainder of the trip will be equally so. Excepting for the first two days of the trip, when it rained hard and the roads were muddy, the trip has been almost without incident, and we have simply sailed along as fast or as slow as we pleased, enjoying the beautiful scenery which, by the way, we expect will be even more beautiful as we go west."

When Mrs. Ramsey left New York, June 9, on the first transcontinental trip ever attempted by four women, in her Maxwell touring car, she was given a right royal sendoff, and this has been continued in each city where a night stop was made. Buffalo was reached on Saturday, and the tourists remained there until Tuesday on account of the reception accorded them and the many requests to do so. On that day they traveled to Erie, reached Cleveland on Wednesday, Toledo Thursday, South Bend Friday, and Chicago on Saturday.

Many have been asked why the women are taking this long trip. This can best be answered by the fact that Mrs. Ramsey is an ardent automobile enthusiast, who believes in the driving of cars by women just as much as by men. As proof of the ease with which women can handle a car, make all necessary road repairs and such, Mrs. Ramsey decided to spend a vacation on a long tour, and in a way blaze the way across the American continent for other fair motorists. This is the real reason for the trip, which no woman has ever before attempted without a man at the wheel. And, too, there is other reason for it; her desire to see properly the beautiful Western country in the proper way. On the trip she is driving the same Maxwell car in which she has competed with great success in a number of endurance runs in New York and Philadelphia. Her knowledge of the car is most thorough and capable.

LOGICAL PLEA FOR AUTOMOBILE SANITY

By CHARLES CLIFTON, PRESIDENT, A. L. A. M.

Automobile owners, as a rule, in discussing their costs generally name the great item of expense as being tires, and in that connection they are quite inclined to arraign the makers of pneumatic tires as being responsible for this condition. These statements are an individual expression of opinion based on more or less experience, and doubtless justified in part by the records of bills paid.

These remarks in the same sense are an individual expression of opinion based upon the same facts and are contributed in the hope that they may suggest a way of reducing the sum total of tire bills, as well as leading in the direction of safer and saner methods in driving, and, in the last analysis, greater pleasure from motor cars.

There are three prime factors responsible for short tire life. First, excessive speed, especially during the warm months. Second, changes of direction at a high rate of speed; and third, excessive and unnecessary use of mechanical brakes. My experience has gone to prove that—punctures excepted—the life of tires is enormously prolonged by avoiding the above three cardinal enemies of the pneumatic tire.

So much for the direct money cost, but if these three cardinal principles are insisted upon by owners, the liability of accident will be reduced to a minimum, and all the high costs incident to property and personal damage. Accidents will also be reduced, as well as wear and tear mentally on an owner in connection therewith. In other words, sanity in the use of the motor car is an incalculable money value which no owner should ignore; and the reverse of the proposition is an unnecessary extravagance, which if indulged in should not carry with it an invective against the tire manufacturer or the manufacturer of the motor car. In other words, the responsibility for high costs in running expenses is absolutely in the hands of the owner, or perhaps more directly in the hands of the driver. Excessive speed under all conditions is done at high cost which can only be reduced by the adoption of sane methods.

To go a step further in this line of reasoning, I wish to plead for saneness in the use of highways. Not only in the matter of excessive speed, but also in the relation which should subsist between those who ride in cars and those who use it in other and older ways. The antagonism of the farmer against the automobile is mainly the result of a series of circumstances which to "the other fellow" seems like a succession of outrages. It is well for the driver of a motor car to realize that the other fellow used the highway, more or less unmolested, ever since there were highways. That while he may feel he has pre-emption, that pre-emption goes no further than the joint use. For the driver of a motor car to assume to use more than his share of the road, to make of his vehicle a menace, or at the very least a nuisance to other users, is a very natural cause for antagonism. The users and drivers of motor cars can, by sane driving, do the larger part in accomplishing a reversal of this sentiment, and in any event only fair play will eliminate the present friction.

NO RACE TO BE HELD AT DIEPPE

PARIS, June 16—The project to hold an open speed test on the Dieppe course, with Victor Breyer as manager, has been abandoned in view of the disinclination of the authorities to grant permission. Although the proposed race was in no way connected with the Automobile Club of France, and was intended more for private owners of racing cars than for manufacturers, the promoters were made to understand that a petition to hold the race would not be favorably received unless it came through the club. Naturally the racing board of the club did not look with any favor on the intruder and the project had to be abandoned. It is declared that the club promised to hold an international race itself next year on the Dieppe course, but no official confirmation of this is available. If a race is held at Dieppe the Angers district will have just cause for protest.

CARRIS BEST IN PENNSYLVANIA ENDURANCE RUN

By GEORGE M. SCHELL.

PHILADELPHIA, June 19—After one of the most grueling contests of the year, the State Highway Endurance contest of the Quaker City Motor Club, from this city to Pittsburg and return—750.5 miles—came to a conclusion last evening with the veteran Franklin-Carris combination a long-margin winner in Class A (touring cars over \$2,000); the 45 horsepower Haynes, driven by Walter E. Shuttleworth, annexing the Class C trophy for runabouts over \$2,000, and Walter Cram, in his Mitchell "20," capturing the Class D cup for runabouts listed at \$2,000 or less.

A series of rains during the preceding fortnight had rendered all but the comparatively few-and-far-between stretches of State highway met with on the route nearly untravelable in many places, especially through the mountains, and fully 40 per cent. of the route may be included in this category. The road conditions were frightful. Soft, adhesive mud and ruts—the latter in some places 15 inches deep—formed the roadbed in these sections, and the strain put upon the cars by the continual grind, and the subsequent speeding in an effort to make up lost time, told heavily in the penalty column. That the small, but select entry list should have stood the continued pounding as long as they did is little short of wonderful. As it was, the two cars that fell by the wayside—the Elmore and the Palmer & Singer, both in Class A—had finished four-fifths of the journey, and that the hardest part before they succumbed. In the case of the Elmore, which had been clean score all along, it took an accident to eliminate it—a contrary countryman refusing to give young Hardart, its driver, sufficient room to get past, the taking of a long chance resulting in the tearing loose of the car's rear construction by a skid into a roadside culvert heading. Broken springs in a section far removed from a repair shop so delayed the Palmer & Singer on the last day that it was withdrawn. Nearly all troubles were caused by terrible roads.

The strenuous experiences of the Haynes crew began on the first day and continued through to the end. As related in last week's issue, a broken axle 75 miles out from Williamsport, the night stop, cost the car over 12 hours time penalty, and the second day's start was made with but an hour's interval for breakfast and supplies. Shuttleworth, although nearly exhausted, managed to get into Johnstown with but 15 minutes' time penalty registered against him, due almost entirely to his unwillingness to take chances with the light axle that had been sent him from New York to replace the broken part.

Coming out of Johnstown, Wednesday morning, Shuttleworth took to the sidewalk to avoid collision with a trolley car at the entrance to the bridge over the Conemaugh, and was not only dragged before a magistrate and fined (the fine was later remitted) but so weakened his right front wheel that it collapsed at Armagh, ten miles farther on. It looked so much like a "down-and-out" proposition that Observer Skinner abandoned

the outfit and went to Pittsburg in a Pullman (P. R. R.). But Shuttleworth and Rose, his mechanic, were not to be denied; they found a blacksmith, who, under their instructions, fashioned spokes out of rough hardwood with a saw, hatchet and shave-knife, and in eight hours had put a new wheel together. At 1 o'clock they were en route, and ran into the Smoky City while the rest were eating breakfast. They snatched three hours' sleep and started after the others, reaching Lewistown in a downpour at midnight, having lost the road several times because all of the confetti had been washed away. Even the last day was not without its mishap. Getting away from Lewistown about half an hour behind the bunch, the narrows below that town took an hour and a half to negotiate, so bad was the road. The rough going developed a six-inch wobble in the front wheel, and Shuttleworth and Rose spent nearly an hour filing the axle in order to take up the play. Everything then went well until Downingtown was reached, when, in attempting to change seats with Observer Schell, Shuttleworth fell from the car and was knocked senseless, suffering besides several cuts and bruises. He was fixed up at the country home of Mr. Hardart (entrant of the Elmore which had gone out the previous day), a few miles farther on, and reached Philadelphia about two hours late. The Haynes crew were the happiest in the bunch, and were congratulated on all sides for their plucky performance. They consider the Class C cup, which they won by virtue of being the only entrant, a sufficient recompense.

The Palmer & Singer troubles were almost entirely due to spring trouble, which began the first day and persisted to the end, finally causing the withdrawal of the car at Harrisburg. This is the same car and driver—William Wallace, Jr.—that made such a good showing in the Fairmount Park 200-mile stock chassis race last October. Ten miles outside of Pittsburg, Wallace discovered that the steering post was broken. They were just approaching a hairpin turn leading down the steep hill into Wilmerding, but Wallace discovered the defect in time to jam on the emergency and stop the car just at the turn. An instant's hesitation on his part and the whole outfit would have shot over the fifty-foot declivity. The car was finally worked down to the foot of the hill, where, after a wait of three hours for help from the Smoky City, Wallace and Ralph, his mechanic, became tired of the delay and rigged up a "first aid" substitute steering device, which got them into town at about 4 o'clock, nearly five hours late. Sitting astride the hood, Ralph pushed on the reach rod, and Wallace, by means of a piece of clothesline attached to the front axle and with a screw driver for a handle, guided the car the remaining ten miles to the Banker Brothers garage. Next morning they put in a new steering-post, and were delayed so long that the heavy rain, which began about midday, took out a small bridge over a run,



Carris and Franklin Six



Cram and the Mitchell

which had been passed by the others hours before. In half an hour, with the aid of lumber from a nearby farmyard, they built a substitute bridge, and reported at Lewistown about 8 o'clock, only to be finally eliminated on the last day by inability to replace their broken springs. They finally limped into Harrisburg about sundown, too late to push on to the finish.

Young Frank Hardart, Jr., the only amateur driver in the run, had the sympathy of all hands when his car was rendered hors de combat only eight miles from the fourth day's control by an accident. The Elmore, which had an absolutely clean road score up to the point where the accident occurred, was well ahead of its schedule and was bowling along the good State road, which extended all the way to Lewistown, when, in attempting to pass a team whose driver refused to give him half the road, the rear of the car swung into one of the concrete culvert headings which line the road and tore the rear springs loose from the axle and damaged the right rear wheel. It was beyond the ability of Hardart and his younger brother, who acted as his mechanic, to fix up the car in order to reach Lewistown, and it was dragged into a nearby barn. A passing auto carried the party into night control, and they left for home on the 8 o'clock train, a sadly disappointed party.

Carris, as usual, failed to get into the limelight. He is so careful and conservative, and withal so speedy when the conditions favor, that he had not a particle of trouble on the road. The Franklin came into Philadelphia without a mark on the observer's cards for the whole five days, and although the technical committee's examination developed 21.2 points penalties against the Franklin, that total is decidedly small when the conditions of the strenuous 750-mile journey are taken into consideration. On the fourth day, in the midst of a driving downpour, Carris ran past a turn, it being absolutely impossible for his younger brother, who was keeping tabs on the "dope book" to see the print. Four miles farther on he discovered his mistake and ran back. It was then that the usually conservative Carris took a chance and "beat it" to such purpose that he made up his lost time and pulled into Lewistown a few minutes ahead of schedule. Even this racking had no deleterious effect.

Cram's experience with his Mitchell was almost identical with that of Carris, and apart from a 3.2 penalty for replacing a defective spark-plug, his road work was faultless. Naturally, the heavy going told more heavily against his little Mitchell than against the big Franklin, but he had to punish his car to reach the night control on almost every leg of the journey.

There was no press car on the run, THE AUTOMOBILE representative securing an observer's appointment in order to keep

tabs on the doings. It was a coincidence that on the only days that the Haynes reached a night control before sundown, THE AUTOMOBILE man occupied the observer's seat.

Pilot and acting referee "Doc" Overpeck did the bulk of the driving on the pilot car, Norman Stadiger's Chalmers-Detroit, and with the exception of the first day, when a troublesome clutch delayed the "spaghetti" car so persistently that Overpeck had to transfer his flag to one of the contesting machines, the Chalmers-Detroit performed splendidly throughout the run.

The Quaker City Motor Club carried out the run with the same attention to detail as if there had been thirty instead of five cars on the road, and the loss of upward of \$1,000 was borne without a murmur. Lack of cars was the only trouble.

The following schedule shows the distances, times and running schedule for each of the five days of the run. On only one day, Wednesday, was it found advisable to adhere to the previously decided upon 20 miles an hour running time. On all of the other days the 18-mile schedule prevailed.

Day	Route	Running Schedule		Total Running	
		M. P. H.	Dist.	Dist.	Time
Monday	Philadelphia to Williamsport	18	191.2	1-2	191.2 10:39
Tuesday	Williamsport to Johnstown	18	146.2	1-2	337.5 8:08
Wednesday	Johnstown to Pittsburgh	20	74.7		412.2 3:45
Thursday	Pittsburg to Lewistown..	18	170.9		583.1 9:30
Friday	Lewistown to Philadelphia.	18	167.4		750.5 9:20

CLASS A, TOURING CARS OVER \$2,000

No.	Car	H.P.	Driver	Penalties		Total
				Work	Tech.	
13	Franklin	42	C. S. Carris	0	21.2	21.2
5	Elmore	35	F. Hardart, Jr.	out	4th day	1000.
1	Palmer & Singer	60	W. Wallace, Jr.	out	5th day	1021.6

CLASS C, RUNABOUTS OVER \$2,000

4	Haynes	45	Shuttleworth	2543	115.2	67.	2725.2
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CLASS D, RUNABOUTS, \$2,000 OR LESS

6	Mitchell	20	Cram	0	3.2	342.9	346.1
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DETAILS OF TECHNICAL PENALTIES

Franklin—Loose grease cup, 2; loose muffler, 5; 2 lost body bolts, 1.2; loose body bolt, 1; 6 loose chassis bolts, 1.2; 5 loose push rod bearings, 2.5; loose boot on driving shaft, .2; broken brake support, 3; loose steering-connection, 15—total 21.2.

Haynes—Leaky radiator, 3; 2 broken spring leaves, 6; loose spring clip, .2; 2 broken chassis bolts, 2; 2 loose chassis bolts, .4; bent axle, 25; 2 missing screws from commutator shaft, .4; 2 loose steering connections, 30—total, 67.

Mitchell—Broken oil lead, 5.2; loose radiator, 3; leaky water connections, 3; broken spring leaf, 3; broken spring clip, 2; loose muffler, .5; lost body bolt, .6; 9 broken chassis bolts, 9; 6 loose chassis bolts, 1.2; 2 leaky gasoline pet cock connections, .2; leak in gasoline tank, 10; 4 broken and worn-out bearings on front wheels, 200; loose cross member frame, 50; loose dash steering housing and broken bracket, 25; loose ignition connection, .3; 2 loose steering connections, 30—total, 342.9.

Elmore and Palmer & Singer not examined by technical committee.

THE AUTOMOBILE CALENDAR

Shows, Meetings, Etc.

- Aug. 5-7.....Chicago, Midsummer Meeting Society of Automobile Engineers.
- Nov. 6-13.....Atlanta, Ga., Auditorium-Armory, National Automobile Show.
- Dec. 31-Jan. 7....New York City, Grand Central Palace, Decennial International Automobile Show: American Motor Car Manufacturers' Association, with Importers Automobile Salon and Motor and Accessory Manufacturers. Alfred Reeves, General Manager, 505 Fifth Avenue, New York.
- Jan. 8-15.....New York City, Madison Square Garden, Tenth National Show, Association of Licensed Automobile Manufacturers.
- Feb. 5-12.....Chicago, Coliseum, Ninth Annual Automobile Show, National Association of Automobile Manufacturers. S. A. Miles, General Manager.

Races, Hill Climbs, Etc.

- June 21-26.....Binghamton, N. Y., Fourth Annual Endurance Run, Binghamton Automobile Club.
- June 22-28.....Albany, N. Y., Fifth Annual Tour, Bretton Woods, Portsmouth, Boston, Albany Automobile Club.

- June 24-26.....Montreal, Blue Bonnets Track, Race Meet. R. M. Jaffray, Manager.
- June 25-26.....Philadelphia, 24-Hour Track Race, Quaker City Motor Club.
- June 26.....Cincinnati, O., Hill Climb, Cincinnati Automobile Club.
- July 3 and 5.....Wildwood, N. J., Straightaway Races, Motor Club of Wildwood.
- July 4.....Los Angeles, Cal., Southern California Automobile Dealers' Association. Road races, 250 Miles for Large Cars; 150 Miles for Light Cars.
- July 12.....Detroit, Start of Sixth Annual A. A. A. Tour for Glidden Trophy.
- Aug. 5.....Chicago, Fourth Annual Algonquin Hill Climb, Chicago Motor Club.
- Sept. 6-11.....Lowell, Mass., Automobile Carnival, Lowell Automobile Club.
- Sept. 15.....Denver, Col., Start of Flag to Flag Endurance Run to Mexico City.
- Oct. 7.....Philadelphia, Second Annual Stock Chassis, 200-mile Race, Fairmount Park, Quaker City, M. C.
- Dec. 29-30.....Philadelphia, Fourth Annual Midwinter Endurance Contest, Quaker City Motor Club.

LONG ISLAND HAS A MOTOR HUNT



Manager Pardington Instructs a Contestant.



At an "Automobile Blue Book" Station in Jamaica.



Krug's Corner, Famed in Vanderbilt Race Lore.



One of the Blind Checking Stations.

NEW YORK, June 21—Most unique in its idea and more or less aimless in its procedure was the "motor hunt" held on Thursday in connection with the celebration of the opening of the Queensboro bridge. For an entire day, twelve hours, about twenty-five automobiles scurried around the western end of Long Island in a search for blind controls where they might secure marks entitling them to some really valuable prizes. The plan of the event called for a hunt for these stations and for a "quarry" car, and the autoist whose card was punched the greatest number of times at the former, or who met the latter most often, was to be declared the winner. There was a tie. Charles W. Landers, in a Chalmers-Detroit Thirty, and William Allen Kissam, in a six-cylinder Ford, were deadlocked when the cars were examined in the evening, and in addition Mr. Landers won quarry prize by meeting the elusive auto the largest number of times. Mrs. J. N. Cuneo was one of the contestants and will probably get third or fourth place. Some method will be arranged by which the tie for the two trophies, both bronze statues, one valued at \$250 and the other at \$100, will be decided.

The interest among the participants was such that the machines were kept at work throughout the dozen hours, hunting up real estate offices, hotels, and other certain places, such as garages, where it had been announced the controls would be found, and indicated by a flag. Secrecy had been maintained successfully as to the location of the stations so that little or no hold could be secured by the contestants, and the quarry car kept so well away from the others that the score of the winner, even, was low.

THAT BRIARCLIFF RACE ROAD DEPOSIT

NEW YORK, June 21—An interesting echo of the Briarcliff race has been heard in the decision of Justice Truax, of the Supreme Court, in regard to the money paid to State Engineer Skene, for possible damage to the roads in Westchester county over which the contest was held. Two days before the race, which was run on April 24, 1908, the State official demanded \$4,600, as a guarantee against possible injury to the highways and expense to the State of repairing them, threatening to stop the race unless the money was paid. According to the Court, Skene had no legal right to make this demand and therefore must return the full amount, instead of but \$582.14, thus bringing up the case. Robert Lee Morrell, the plaintiff, had paid the money to Skene.

The decision is based upon the State laws which allow any locality to give over its road for a special race, imposing such conditions as are necessary, but in the case of the Briarcliff there were no conditions made by the officials who gave the permission. There is nothing in the automobile law which makes it necessary to obtain the consent of the State engineer, and the only law under which the latter could have acted is that providing for the improvement and protection of highways, for the disobedience of which a fine of not less than \$10, nor more than \$100 may be imposed. Therefore it was decided that Engineer Skene might have sued for the penalty, but not the damages. Inasmuch as he had no power to recover the amount of the damages, he had no authority to exact a deposit.

COMPLETING PLANS FOR GLIDDEN TOUR

DETROIT, June 21—There will be "something doing" every minute, from the time the first of the Glidden entrants reaches Detroit until the last car has started out Michigan Avenue on the journey which will end at Kansas City some three weeks later. Local committees having the entertainment of tourists and visitors in charge are planning doings that will leave pleasant memories in the minds of all, for all time, and nothing will be left undone to make those who visit Detroit realize that the hub of the automobile world fully appreciates what such an event as the Glidden tour means. Quick to grasp the import of the occasion, the city, at the suggestion of Mayor Breitmeyer, donated a beautiful trophy, to be awarded the successful contestant in the baby tonneau class, thereby adding to the interest of the event. It has also been officially decreed that motorists will own Detroit from the moment the first of the tourists arrive until it is all over. "Glidden Tour Days" is the title bestowed on



Trophy for Runabouts Offered by Chairman Hower

July 9 to 12 by the local committee appointed by the Detroit Automobile Dealers' Association to arrange for the entertainment of A. A. A. officials, entrants, automobile manufacturers, and others who will be here during that period, and "rare old Glidden tour days" they will be.

Friday evening, July 9, will witness the formal opening of festivities with a banquet for A. A. A. officials and newspapermen, at which Mayor Breitmeyer will turn the keys of the city over to Chairman T. B. Hower, of the committee. Saturday morning the visitors will inspect the local auto plants, starting from the Hotel Pontchartrain. Automobiles will be provided for all and a new understanding of Detroit's position in the industry is bound to follow. Saturday afternoon comes the automobile parade, the big feature of the three days' celebration, which promises to be one of the greatest ever. Not only Detroit motorists, but those from surrounding towns will participate, and prizes will be awarded for the best decorated machines in four divisions—gasoline, electric, commercial, and motorcycle. The parade will start downtown and end at Belle Isle, where there will be an athletic carnival participated in by employees of local automobile factories, with a long list of prizes.

Sunday morning the visitors will board the City of Cleveland, the finest sidewheel passenger steamer in the world, chartered for the occasion by the D. A. D. A., and will be afforded a glimpse of Detroit's water facilities. The boat will proceed down the river, past the world-famous Limekiln Crossing, Bois Blanc, Sugar Island, and other down-river resorts, to Lake Erie; then

run up the river across Lake St. Clair, through the St. Clair Flats, the "Venice of America," and back to Detroit, reaching the city early in the evening.

Monday morning, July 12, at 9 o'clock, the Glidden tour will start from in front of the city hall with due éclat. The Maxwell band of the Maxwell-Briscoe Company will be on hand to provide music, and local motorists will be out in force to give the tourists a fitting send-off. Business will be intermingled with pleasure, although neither will be allowed to conflict with the other. The A. L. A. M., the A. M. C. M. A., and the A. A. A. officials will sandwich their annual meetings in between the festivities, which will make it a moderately busy season for all concerned. These gatherings will bring to Detroit practically every prominent automobile manufacturer in the country, and the local committee is bending every energy toward showing the visitors that Detroit is not only the center of a great and growing industry, but that it appreciates what their presence stands for.

Headquarters have been opened by the local committee at the Hotel Fuller, and from now on the pot will be boiling.

The 1909 Hower trophy for runabouts is now being exhibited in the window of an automobile dealer on Broadway, New York. As this trophy is a permanent possession, an entirely new one is put up every season. Last year the trophy was a plaque, handsomely mounted. This year it is a silver loving cup, having three handles and an inscription on each panel between the handles.

Numbers Assigned to Tour Entrants

BUFFALO, N. Y., June 21—Numbers have been allotted to the cars which have entered for the sixth annual tour of the American Automobile Association, and the cars have been sorted into groups according to the trophy for which they will compete. They are as follows:

FOR THE GLIDDEN TROPHY

No. 1 Premier	No. 12 Pierce-Arrow
No. 2 Premier	No. 14 Pierce-Arrow
No. 3 Chalmers-Detroit	No. 15 Glide
No. 4 Marmon	No. 16 Thomas
No. 5 Marmon	No. 17 Midland
No. 6 E-M-F	No. 18 Lexington
No. 7 E-M-F	No. 19 Stoddard-Dayton
No. 8 Maxwell	No. 20 Stoddard-Dayton
No. 9 Maxwell	No. 21 Stoddard-Dayton
No. 10 Maxwell	No. 22 White
No. 11 Jewel	

FOR THE HOWER TROPHY

No. 100 Moline	No. 107 Maxwell
No. 101 Moline	No. 108 Pierce-Arrow
No. 102 Moline	No. 109 Pierce-Arrow
No. 103 Brush	No. 110 McIntyre
No. 104 Brush	No. 111 Stoddard-Dayton
No. 105 Chalmers-Detroit	No. 112 Jewel
No. 106 Hupmobile	No. 114 Mason

FOR THE DETROIT TROPHY

No. 51 American Simplex	No. 53 Premier
No. 52 Chalmers-Detroit	

NON-CONTESTANTS

No. 75 Rapid Truck	No. 77 Diamond Rubber Company
No. 76 "The Automobile" and "Motor Age"	

OFFICIAL CARS

No. 98 Pilot, E-M-F	No. 99 Chairman, Premier
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Indians Now Buying Autos—"Lo! the poor Indian" is a forgotten phrase on the Cheyenne River Indian reservation, for the redskins, just to show that they are not poor, as well as to enjoy the pleasures of touring, are investing in automobiles, according to reports from Pierre, South Dakota. The camera and the typewriter are also gaining general use among the redskins.

What the Clubs Are Doing These Days

BALTIMORE HAS ITS "BIGGEST" SUCCESS

BALTIMORE, June 21—Orphans' Day in this city, last Wednesday—a week later than scheduled time—proved a "biggest" success. It required 180 cars, donated by members of the Automobile Club of Maryland and other owners, to take the more than 900 little ones on their annual tour over the best streets of the city, and then to Electric Park, where they were the guests of honor on the shoot-the-chutes, carousel and other attractions until supper time. A substantial meal was then served. The committee of the club in charge, under Chairman E. A. Dolle, had made splendid arrangements, and the result was the most enjoyable of the several outings.

At noon the cars gathered in front of the clubhouse on Mount Royal avenue, and were divided into 16 divisions, each with a marshal, and dispatched to 15 different institutions, to get their happy guests. They returned and at two o'clock started in single file on a parade, amid the yells and whistles of the boys and girls. After covering several blocks of city streets they entered Druid Hill Park, and were reviewed at the Wallace Monument by Mayor Mahool, who was in a six-cylinder Oldsmobile driven by E. L. Leinbach, manager of the Olds branch. Chairman Dolle's committee was composed of: Frank W. Darling, C. Howard Milliken, Joseph M. Zamoiski and Emmanuel Daniel. Mr. Milliken was also chief marshal.

WHEELING ORPHANS HAVE RIDE AND PICNIC

WHEELING, W. VA., June 21—An automobile ride and a picnic featured the local observance of the national orphans' outing on Wednesday. Under the auspices of the Ohio Valley Automobile Club a great many automobiles were secured and gathered on that morning at 10 o'clock. The children were then brought from the various institutions and led by Mayor Schmidt in his car, were taken on a parade over the city streets. After this the cars were driven to Blayney's Grove for a picnic through the afternoon, and the return was made in the evening.

GRAND RAPIDS ORPHANS OPEN CLUB HOUSE

GRAND RAPIDS, MICH., June 21—The third annual Orphans' Day celebration of the local automobile club was combined with the formal opening of the new club house at Cascade Springs on Wednesday. It was the most successful from the point of numbers and enjoyment to the waifs of the city that has yet been held. Although a dearth of cars was expected 70 cars, 20 more than were needed, reported in the morning ready to carry the 200 homeless youngsters to Cascade Springs for their holiday, where they were cared for and feasted by their nurses and members of the club.

A NEW CLUB IN JERSEY—AT PLAINFIELD

PLAINFIELD, N. J., June 21—With nineteen charter members the Plainfield Automobile Club has been formed, and steps will be taken to include in the membership all automobilists in this city and neighborhood. The following officers were selected: President, Dr. F. C. Ard; vice-president, Harry W. Marshall; treasurer, F. O. Ball; secretary, J. H. Rankin.

ALTOONA AUTOISTS FORM AN ORGANIZATION

ALTOONA, PA., June 21—To promote better streets and county roads, owners of automobiles in this city have formed the Altoona Motor Club with the following officers: President, W. L. Hicks; secretary, E. J. Lomnitz; treasurer, W. W. Blake. An active campaign is being outlined and it is planned to join the A. A. A.

JOY FOR THOUSAND ST. LOUIS ORPHANS

ST. LOUIS, June 21—Fourth annual Orphans' Day was celebrated by the Automobile Club of St. Louis by giving 1,000 children a six-hours entertainment. Twelve institutions furnished the quota, of which a careful estimate was made, and in spite of an over-cast sky, and forebodings of a rain that did not occur, the youngsters had a merry time. Each one was provided with an American flag and the privilege of using the voice as loud and long as desired. Members of the club donated cars which were used from 9 a. m. to 3 p. m. and the occupants taken for a long ride. Alden H. Little was grand marshal and he provided each chauffeur with a printed form which may be of value to some other club next year. It read: "Do not exceed the speed limit. Mr. ———'s car. Go at once to ———, located at ———. Take as many children as you safely can and be sure a responsible



Delegation of St. Louis Orphans Ready to Start

attendant accompanies you. Give the children a ride of not more than ——— hours, and report back to the same place for the next load. In case of trouble which cannot be fixed in 30 minutes, telephone A. H. Little at once, number ———. Please drive with greatest care as the children are not accustomed to automobiles." About fifty machines were used, and some took several loads of youngsters out during the course of the day.

GALVESTON ENTERTAINS ORPHANS WITH A RIDE

GALVESTON, TEX., June 18—Orphans of the various charitable institutions were given their second annual outing by the Galveston Automobile Club on June 8, nearly 200 children being given a long ride by the 50 automobiles donated, and as much ice cream as they could eat furnished by a club member. The run started from the library on Tremont street, in the heart of the city, after the cars had collected the inmates from the homes, and a line formed in which electric autos took the lead. For an hour and a half the ride was around the city, with flags and horns supplied to the little travelers. Lunch and enough ice cream to satisfy the most ravenous youngster were given by one of the members of the club who is an ice cream manufacturer, after which the ride was resumed and the course laid to the seawall boulevard, up and down which the cars sped to the hearts' content of the occupants, and then returned to the institutions from which they had started. Pleasant features of the event to the club were found in the interest shown throughout the city, and by the fact that with 60 members nearly 50 cars were available, in addition, of course, to the enjoyment furnished.

BOSTON AUTOISTS MAY UNITE IN NEW CLUB

BOSTON, June 21—Another attempt to consolidate the Bay State Automobile Association and the Boston Motor Club is being made, and at a recent meeting of the directors of the two organizations terms for a merger were drafted. These have been submitted to the members for action, and it is expected that it will be favorable, thus uniting the bulk of the local autoists. The Boston Motor Club was organized about six months ago by some members of the Bay State Association and others, who secured a charter and elected officers but never had permanent quarters. In its membership are several prominent members of the trade, while others equally prominent remained in the Bay State. Several attempts to bring about a merger have been made but none of them has had any result.

The terms now proposed include the merging of the Bay State Association and the Motor Club in a third organization to be called the Bay State Motor Club; that members of both organizations who have passed their respective membership committees be admitted to the new club; that joint committees from the two organizations prepare a list of officers and a new set of by-laws, and that the assets of both organizations be placed in the treasury of the new club. The Bay State Association has called a special meeting to act on the matter on Wednesday, June 30. It is thought that the members favor the move.

QUAKERTOWN, PA., AUTOISTS ORGANIZE CLUB

QUAKERTOWN, PA., June 21—So many of the residents of this place and of the surrounding country have purchased automobiles that the owners decided to join hands in order to push good roads and other work in this vicinity. Accordingly the Quakertown Motor Club has been formed with the following officers: President, Fred L. Harley, Quakertown; first vice-president, M. L. Cope, Perkaspie; second vice-president, Dr. W. H. Brown, Richlandtown; third vice-president, C. F. Newcomer, Coopersburg; secretary, Howard R. Moyer, Quakertown; treasurer, Charles Stoneback, Coopersburg; solicitor, Harry E. Grim. A committee on by-laws is composed of: John Freed, Richlandtown; J. Howard Ozias and M. T. Free, Quakertown. The membership committee is: Dr. W. H. Brown, Richlandtown; W. O. Haney, Milford Square; Ralph Stauffer, Coopersburg; Mr. Kulp, Perkaspie. One of the first acts of the club will be to request a re-pairing of the pike leading through Richland and Springfield townships to Coopersburg.

CHATTANOOGA AUTOMOBILE CLUB ORGANIZES

CHATTANOOGA, TENN., June 21—The Chattanooga Automobile Club has taken a new lease on life through reorganization, and a vigorous campaign for good roads and other matters of interest to autoists mapped out will be entered upon at once. The membership in the body will be limited to 150, and these must be private owners living within 50 miles of this city. At the recent meeting it was reported that 60 autoists have joined, and that there are 34 more applicants. The following officers have been elected: President, H. S. Probasco; vice-president, C. F. Milburn; secretary, C. E. Kirkpatrick; treasurer, L. W. Llewellyn; directors, B. F. Thomas, H. W. McCallie, Carl Painter, C. A. Raht, R. L. Williams.

KENTON, O., AUTOISTS WOULD BUILD PIKE

KENTON, O., June 21—The Kenton Automobile Club, which has a membership of more than 50 of the leading business men of this city, has made a unique offer to the county commissioners. The club asks permission to select a pike in Hardin county and improve it under the direction and at the expense of the club members, who wish to take a stretch of four miles of pike and entirely reconstruct it, making it a model highway. The club also asks the commissioners to place guide posts at every road crossing in the county, and has sent to Toledo and Columbus for copies of the traffic ordinance with a view of enacting a similar one here.

WARREN COUNTY, N. J., GETS A CLUB

WASHINGTON, N. J., June 21—Automobilists of this city and the surrounding country, more than 90 of them and all owners of cars, on last Wednesday evening met here and organized the Warren County Automobile Club. The members were addressed by F. H. Elliott, of New York, secretary of the American Automobile Association, with which the new body will be affiliated; and by W. C. Crosby, president of the New Jersey Automobile and Motor Club and also president of the Associated Automobile Clubs of New Jersey. The following officers were elected: President, D. M. Perry, Washington; vice-president, R. D. Huff, Hackettstown; secretary, W. H. Rhodes, Phillipsburg; treasurer, J. R. Bryant, Washington. Five directors were chosen, as follows: W. D. Gulick, Washington; J. R. Stires, Penwell; A. Blair Kelsey, Belvidere; Matthew Suttle, Phillipsburg; Dr. L. C. Osmun, Hackettstown. Dr. C. B. Smith, Washington, was elected as a director to the A. A. A., and Dr. W. C. Albertson, to a similar office in the Associated Clubs.

SAVANNAH CLUB TO MARK ROADS

SAVANNAH, GA., June 21—All good roads will lead to Savannah in a few months; at least this is what the Southern traveler will think after the Savannah Automobile Club has carried out plans which have been formulated by Secretary A. W. Solomon.

Mr. Solomon has ordered a large number of steel signs, in shape and color like the Savannah automobile pennant. The red-and-white sign telling the mileage to Savannah will soon be a familiar landmark on every road leading to that city, accessible to motorists. The indicators will be distributed through a territory within a radius of forty or fifty miles; with Savannah as the starting point. Autoists from the North, traversing these roads, will be given a taste of Savannah enterprise long before their arrival here.

BOULDER, COL., NOW HAS A CLUB

BOULDER, COL., June 21—Boulder Motor Club has been organized by the enthusiastic automobilists of this place, about 25 in number, and the following officers have been chosen: President, O. J. Watrous; secretary, C. L. Bennett. The committee on by-laws is composed of Dr. W. Scott, L. B. Overfelt and Louis Herman; and the committee on membership includes O. N. Gilbert, G. W. Blackburn and Ernest Grill. An invitation has been extended to the officers of the Denver Motor Club to meet with the local body to arrange a plan to secure better roads between this city and Denver. Similar work will be undertaken with other automobile organizations in the vicinity in order to have improved highways leading in all directions, especially into the mountains and to the North, toward Cheyenne and other Wyoming points.

HAMILTON, O., AUTOMOBILE CLUB IS FORMED

HAMILTON, O., June 21—With a charter membership of 50 owners of autos, the Hamilton Automobile Club was formed recently in this city. The officers of the old automobile club were adopted as the temporary organization of the new one, as follows: President, C. E. Hemp; secretary, Mark Sohngen; treasurer, Dr. F. M. Barden. It was decided to begin an active campaign for increased membership, and committees were appointed on constitution and by-laws, and on membership.

VICKSBURG, MISS., AUTOISTS ORGANIZE

VICKSBURG, MISS., June 21—Enthusiastic autoists of this city, in order to work together to obtain improved roads and other conditions, have formed the Vicksburg Automobile Club, and have chosen the following officers: President, Dr. R. A. Quin; vice-president, W. L. Nicholson; secretary, Lee Richardson; treasurer, J. J. Lum; directors, Dr. W. H. Penn, J. H. Hempen, P. S. Craig, A. A. Kuhn, G. L. Ryan, W. N. Dupree, J. W. Hayes, Jr., M. Kaufman, T. J. Hays, F. J. Fisher.

GOVERNOR VETOES NEW WISCONSIN LAW

MILWAUKEE, WIS., June 21—Governor Davidson has vetoed the Page bill, a statute to regulate automobiles, which had been passed by the Senate without a speed clause and amended by the House to have eighteen miles an hour in cities and twenty-five in the open country. The veto says in part: "My objection is based upon two propositions, the first of which is that it permits automobiles to be run at a rate of speed not to exceed eighteen miles per hour within the corporate limits of any city or village. . . . The laws of Wisconsin limit the speed of railroad trains running on a defined track, on schedule time, to twelve miles per hour in entering or passing through cities or villages. . . . A speed of eighteen miles per hour means that the vehicle may pass along populous streets twenty-six feet at every tick of the watch. This . . . is highly improper and dangerous." The other objection, is that the section relating to penalty refers to sections of a statute previously passed instead of to the entire law, which would make convictions impossible, he says.

This action came as a surprise to those interested in the affair, for it was known that the Legislature was favorable by its actions and the clubs and State association were satisfied, but the Governor threw it out by his veto and sent it back to the Legislature a few minutes before the time set for final adjournment, obviating any chance of passage over the veto. The Owen-Chinnock bill, increasing the registration to \$2 and requiring motorcyclists to pay, was signed, and all owners must re-register before October 1. When a car is sold the certificate and license tags have to be returned to the Secretary of State.

MARYLAND LAW RESTS IN DEADLOCK

BALTIMORE, June 21—At a recent conference of a committee from the Automobile Club of Maryland, with Osborne I. Yellott as spokesman, and the State automobile commission, it was impossible for the two sides to get together on the tax and license feature of the bill prepared by Colonel Sherlock Swann, a member of the commission, so that it will be necessary for the next Legislature to settle the differences. The commission held out in favor of the rates fixed some time ago, as follows: Under 20-horsepower, \$6; over 20 and including 30-horsepower, \$9; over 30 and including 40-horsepower, \$18; over 40-horsepower, \$24. The commission would have manufacturers and dealers' licenses arranged on a basis of annual business to \$10,000, \$25; between \$10,000 and \$25,000, \$50; between \$25,000 and \$50,000, \$100.

The autoists, according to Secretary Darling, of the Automobile Club, want the license arranged in this manner: Up to and including 20-horsepower, \$6; over 20 and including 30-horsepower, \$9; over 30 and including 40-horsepower, \$12; over 40-horsepower, \$15, provided that a wheel tax is imposed on all other vehicles within the State at the rate of 25 cents per wheel for one-horse pleasure vehicles; 50 cents a wheel for two-horse vehicles, and \$1 per wheel for four or more-horse teams; with the further provision that such vehicles shall be required to have lights at night. This wheel-tax feature does not meet with the approval of the auto commission.

FOR ONE YEAR'S AUTO WASHING, \$1.20

DETROIT, June 21—Hereafter owners of automobiles will have to pay \$1.20 yearly for the water used in washing them. The reason is that the water board needs more money. The horse has been taxed for what it drank. Every truckman has had to pay for the privilege of bathing his vehicle. But to date the automobile has been immune. Now the buzz buggy has been promoted to the same rank as other vehicles. Whether it will appreciate the honor conferred is a question. At all events, it is anticipated that the man able to maintain a machine will manage somehow to scrape up the \$1.20 levy imposed by the water commissioners.

Present indications are that ultimately some sort of a compromise may be effected, but the outlook just now is quite indefinite.

SOME OHIO REGISTRATION STATISTICS

COLUMBUS, O., June 21—The report of the State register of automobiles for the year ending June 10 is interesting as indicating the trend of the industry and the number of automobiles registered in the first fiscal year of the present law. During the twelvemonth there was 17,192 autos registered in Ohio, which produced a revenue of \$82,406; manufacturers and dealers numbered 366, and the income from them was \$3,660; there were 784 certified copies issued, totaling \$1,568; altogether 2,741 chauffeurs took out licenses, valued at \$5,482, and duplicate tags were issued to the number of 154. Owners' renewals numbered 226, producing \$1,534, and the total revenue to the department was \$94,835.

Amendments have slightly changed the law, for by the enactments of the last session of the general assembly, all licenses expire on December 31, instead of one year from the date of issuance. Renewal blanks are now being sent 10 days before the expiration of the license, and the renewals, as well as all new licenses, are for the remainder of the calendar year.

CONNECTICUT LAW LARGELY AMENDED

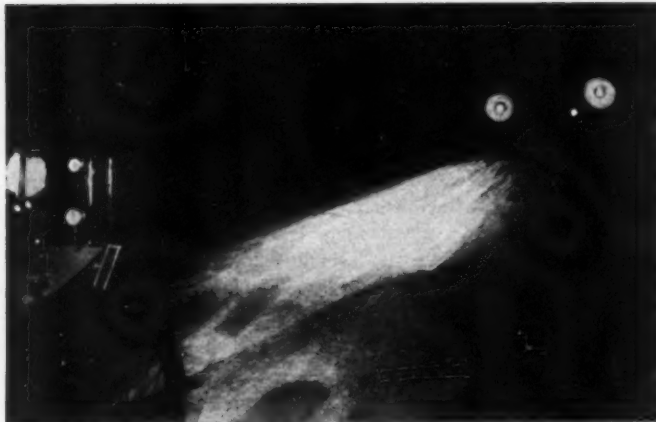
HARTFORD, CONN., June 21—If ever a proposed law was riddled to a record-breaking degree, it was the statute to regulate automobiles in this State, which received thirty-three amendments on Wednesday in the House, not all of which were carried, but a goodly number left their imprint upon the Senate measure. Matters of speed, licensing, and age of the operators were given most serious consideration. It was decided that no one under 18 years of age should be allowed to drive, changing the text from 16, and it was advised that an operator who has his license revoked could not secure another one for two years, instead of six months. The speed maximum stands at 25 miles per hour, with that in congested quarters amended to 10, and in passing trolley cars which are receiving or discharging passengers 3 miles per hour. The clause requiring that an auto be timed over an eighth of a mile to show its speed remains, and a fine of from \$100 to \$500 or a sentence of from six months to one year in jail, or both, be applicable when a car injures someone and the driver tries to run away.

OHIO LAW GRATIFIES SECRETARY OF STATE

COLUMBUS, O., June 21—Secretary of State Carmi H. Thompson of Ohio has issued a statement in which he shows the benefits of the Ohio automobile law, which, he claims, has been good for the people and motorists generally. The statement follows: "I believe that the Ohio automobile law, which is comparatively new, having been in force only one year, is as well observed and as well enforced as in any other State, and that the records will show a far less percentage of arrests for non-compliance than in any other State. A great amount of the credit for the rigid enforcement of the statute is due the Columbus, Cleveland, and Cincinnati automobile clubs, all of which are affiliated with the American Automobile Association, and whose work has been in cooperation with the work of this department."

PRO-RATE FEES ACCORDING TO AUTOISTS

COLUMBUS, O., June 19—The bill of Representative Ritter increasing the registration fees for all automobiles in Ohio will not be the only auto bills before the next session of the General Assembly. Senator Cretone of Dayton will again introduce the bill under consideration last session which provides that the fees received from the registration of autos should be pro-rated among the counties of the state in proportion to the number of owners of automobiles in each county. He believes that counties which have none or few automobiles should not receive the same amount of money for their road funds as counties having thousands of cars. While many are of the same belief, they predict impossible difficulties in enforcing such a law.



Why Night Driving Lost Its Terrors for Autoists

NIGHT PHOTOGRAPH FROM THE EARLY DAY

THAT taking photographs of roadside scenes by night is not a recent practice is shown by the accompanying picture taken some years ago, and contributed by Gray & Davis, of Amesbury, Mass. This was taken by Louis Derr, of the Massachusetts Institute of Technology, using two Gray & Davis Bullet lamps, on a Locomobile steam car, and in describing the photograph, Mr. Derr then wrote: "The two bright spots and the smaller one between them, surrounded by circles, are the images of distant Welsbach street lights, the nearest being about 125 feet away, and the two brightest ones being on opposite sides of the street. The very faint spots near the middle of the picture are lights in a house."

"You will notice that the path of light from the car lamps extends up to the street lights, which themselves are not bright enough to light up the roadway sufficiently to show on the print. This gives a basis of comparison of brightness. The picture is not faked in any way."

REGAL 1910 CAR TO CROSS COUNTRY

BUFFALO, June 21—A pleasant little reunion took place in Buffalo on Saturday as an echo of the trip made by the Regal "Snowball Limited" early this spring. Those attending were Mr. and Mrs. Bert Lambert and Mr. and Mrs. Fred. W. Haines, of the Regal Motor Car Co., of Detroit; Mr. and Mrs. Pickard, Mr. and Mrs. Penfield and Mr. Sherman, of the Salisbury Wheel & Manufacturing Company, of Jamestown, N. Y.; Mr. and Mrs. Covert, of the Covert Motor Vehicle Company, of Lockport, N. Y.; R. Harry Croninger, of the Pennsylvania Auto Motor Works, and George D. Wilcox, of the Regal Sales Company, of Syracuse. Mr. Wilcox was the pilot of the "Snowball" on its mid-winter run.

A banquet was served at the Lafayette Hotel, after which the entire party were entertained at the theatre. Announcement was made at this gathering of the proposed trip of the Regal 1910 model, from New York to San Francisco, to leave on July 4. Mr. Wilcox will pilot the car and it will be driven by "Snowball Bill" Smith of the Regal factory. The gathering broke up with the best wishes from all for the success of the proposed trip. The car will be equipped with Empire tires and will carry four passengers.

MAXWELL-BRISCOE BUYS ANOTHER FACTORY

PAWTUCKET, R. I., June 21—The Maxwell-Briscoe Motor Car Company will shortly move from the plant which it has occupied in this place for four years to Auburn, R. I., where it has purchased the works of the Auburn Rubber Boot and Shoe Company. This factory was secured for \$200,000 and is being remodeled so that the capacity will be twice as many automobiles as the present situation affords. The output at present is 2,000, employing about three hundred men, but at Auburn it is estimated by the factory officials, fully 4,000 four-cylinder cars will be built annually. The Maxwell output for 1910 will exceed 22,000 cars.

PREDICTS 1910 WILL BE MAGNETO YEAR

"Nineteen hundred and ten will be noted as a magneto year in the motor car calendar," says J. S. Bretz, president of the J. S. Bretz Company, importers of the Unterberg & Helme high tension magnetos. "Not but what magnetos have been largely used heretofore, but because the magneto will come into its own next year, and by this I mean the undisputed possession of the ignition field."

"Next year magnetos will be furnished as the integral part of a complete car, and not offered as an extra, or an option at an additional price, which sometimes means, in the hands of dealers, an increase of price way beyond the original cost of the magneto."

"Abroad nearly all the popular and well-known makes of motor cars are sold with the magneto as the sole source of ignition, up to at least 30-horsepower and hence it is expected that we will not much longer continue, excepting in big motors, which are hard to start, the idea of having a double set of ignition, which means two complete sets of plugs, wiring, etc., or the dual system of ignition, which really means a set and one-half."

"The sole advantage that both the double and dual systems have over the magneto system alone is the added ease of starting on the spark. On the U. & H. magneto, for large and small four and six-cylinder motors, and which we have been building for some years, we have added three important, well tried out improvements, which easily rank them first among high-tension magnetos which use batteries for starting purposes."

"The first of these improvements is the U. & H. interrupter, which is so designed that wear is really abolished, and as it permits of no adjustment, it is permanently set at the factory, hence after that there is no possibility of false adjustment. The second improvement is the locating of the high class battery timer in the magneto, at the end of the distributor shaft, the timer being advanced and retarded with the interrupter. The third, and not least of these improvements, is the construction of the distributor, which is designed with the idea of preventing the insulation being burned by the high tension spark when the engine is started on the battery switch. The distributor segments are set in a floating ring, which follows the spark advance and retard, but when retarded for starting the brush always touches the right segment."

WHAT IS GOING ON AMONG THE GARAGES

Pittsburg, Pa.—The Standard Automobile Company, through its president, W. N. Murray, has secured property in the East End, on which it will construct automobile salesrooms and garages. One lot is at Baum and Beatty streets, 100 feet on the former, 142 feet on the latter, and was purchased for \$30,000. It is said that another lot has been bought by the same concern for about the same price on Baum street, with a frontage of 80 feet and a depth of 119 feet on its longest line, being fan-shaped. These are near several other garages.

Wellington, Kan.—Joe Feters and Charles Lovingfoss will erect a garage at Eight and Washington streets, 50 by 140 feet in size, with two floors, the lower one to be used as a space for the automobiles, and the upper will be for an auditorium. The building will be constructed of stone.

Anniston, Ala.—Erection of a brick garage on Benson street, between Peoples and Tolly streets, has been commenced by J. S. Fowler. The building will be constructed of brick with a concrete floor and tin roof, 35 by 80 feet in size, and will cost about \$1,000.

Kansas City, Mo.—Permits have been granted for the erection of a garage and warehouse at 1521 and 1523 Grand avenue. The building will have a frontage of 50 feet and a depth of 117 feet, two stories high. The estimated cost is \$22,000.

Clarinda, Ia.—J. B. Eastman has just taken possession of his new automobile garage, which is one of the largest and best equipped in southwestern Iowa. It is 40 by 140 feet in size, with two stories and a basement.



Factory of the Nordyke & Marmon Company, at Indianapolis, Ind.

ENLARGING HOME OF MARMON

INDIANAPOLIS, IND., June 21—Extensive enlargements are now being made in the factory of Nordyke & Marmon Company, Indianapolis, the home of the Marmon car. The Marmon plant is already a very large factory, occupying eleven acres of ground, with a total floor space of 280,000 square feet, and employing 800 to 900 men. Several new buildings have been added in the last few years—two of these are not shown in the accompanying picture. Another building is now to be erected at the extreme rear of the plant, with floor space of 7,500 square feet. This latest addition will house the testing and repair departments, and the space formerly occupied by these departments will be used for enlarging the machine shops and final assembly floors.

In addition to the motor car product, Nordyke & Marmon Co. is also the world's largest manufacturers of flour and cereal mill machinery, the business having been established in 1851. Many parts of the big factory's equipment—such as forge shops, foundries, sheet metal and woodworking departments—are used for all the company's products.

Tires, lamps, gas tanks, Bosch magnets, Hess-Bright ball bearings and similar equipment for Marmon cars are, of course, purchased outright by the company, but nearly everything else about the car is manufactured in this factory. Aluminum, bronze, brass and iron castings, sheet metal work, bodies, engines, transmissions, axles, steering gears—in short, about everything is manufactured from the raw material. One department is devoted exclusively to the preparation of tools, jigs, patterns, etc., so that the interchangeable parts for almost any piece of machinery ever produced by the company can be duplicated accurately and with promptness.

All the buildings are well ventilated and lighted and contain an elaborate system of overhead and surface tracks. Shipping facilities are unexcelled.

The enlargements now being made and additional equipment being installed will permit a greatly increased output of Marmon "thirty-tvos" for 1910.

The 1910 output will be confined exclusively to the "thirty-two" in five-passenger touring car, four-passenger short-coupled car and roadster. Since no changes of consequence over the 1909 will be made, the company will be able to complete the 1910 production early. Deliveries will begin in August.

GENERAL ITEMS OF INTEREST

Few Changes in New Banker Wind Shield—To keep the pace with the automobile manufacturers, the Banker Wind Shield Company has arranged to place its 1910 models upon the market very shortly, and will make early deliveries. George A. Banker has taken up the management, in the place occupied by Arthur L. Banker until recently, and states that the new types will present few changes in design or appearance, the principal one being in a new and improved telescoping rod which is constructed to permit of raising or lowering the glass without the driver's leaving the seat. This feature is obtained by means of an expanding and contracting cone, placed inside the telescoping tube and fitted at the end with a small knurled wheel that tightens or releases the tension as desired. This improvement does away with the nut used heretofore and obviates the necessity of getting out of the car and using the wrench.

Firestone's Record in Trans-Continental—With three cars in the endurance contest from New York to Seattle equipped with the Firestone tires, the Firestone Tire & Rubber Company is keeping close tabs upon their behavior. When the cars started it was noticed that neither of the Fords carried spare shoes, and when this was remarked upon Mr. Ford said: "The car is light enough, and the tires good enough to go through without the use of extra tires." At Denver, H. B. Harper, advertising manager of the Ford company, telegraphed that Ford No. 1 had two and Ford No. 2 had three of the Firestone tires filled with original air. Salzman, in the Acme, reported from Denver with three of the original Firestones in perfect condition, although six pairs of chains had been worn out. From Rawlins, Wyo., he telegraphed that his mileage was 2,674 and the tires still looked like new.

Niagara Power for Franklin Factory—The falls of Niagara, over 150 miles away, are furnishing electric power with which to run the plant in Syracuse, N. Y., in which the Franklin automobiles are made. Niagara power has run the trolley cars and lighted the streets of Syracuse for a year or two, and the H. H. Franklin Mfg. Co. has for some time had available a partial use of cataract power for emergency service. This it has now doubled, making provision sufficiently for its entire factory. This does not mean that the factory will be de-

pendent upon or always use the Niagara electric current. Its own power plant will be used through the winter and most of the year, but in the summer, when power alone, without heating is wanted, the electricity generated at the falls will turn the factory's machinery.

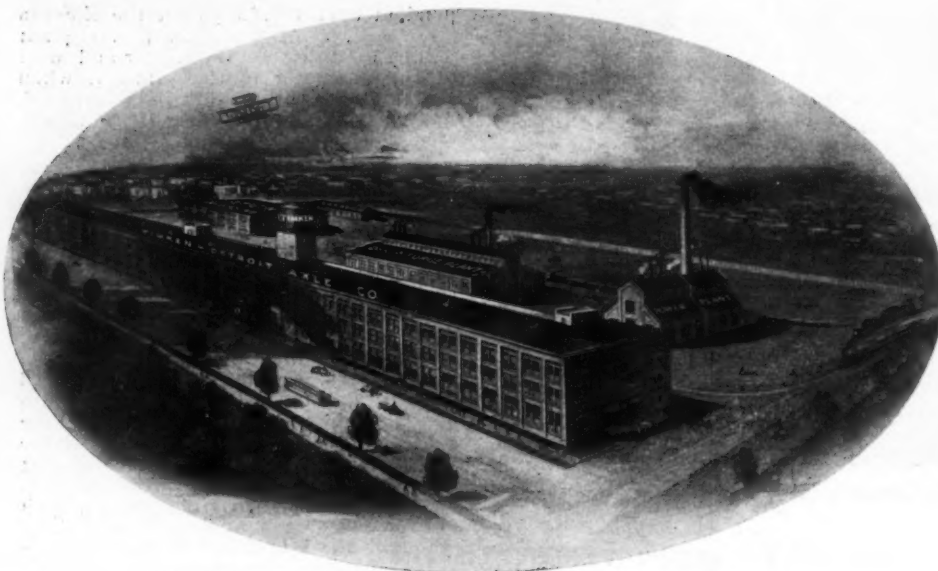
Morgan Truck Waters Dead Horse Hill—In the recent hill climbing contest at Worcester on the Dead Horse Hill it was planned to sprinkle the course between every two events with a 40-horsepower Morgan Trade Motocar, carrying a temporary tank and sprinkling device. The rain, however, had laid the dust so well that it was not needed. Just to show that it was able to do so, if necessary, the big machine covered the entire distance in less than 15 minutes, including stops, the day before the contest. The contest committee of the Worcester Automobile Club decided that the use of one automobile would be better and quicker than eight horses, with one or more tank wagons. In making the climb the Morgan truck had no extra weight on board, but it had no difficulty in keeping traction.

Remarkable Empire Tire Record—The Empire Tire Company, of Trenton, N. J., has found considerable satisfaction in the record of its tires upon cars in recent endurance contests. The latest perfect performance was in the Catskill-Berkshire tour of 350 miles, in which a Thomas taxicab and a Columbia touring car each finished with perfect scores, mechanical and tire. In six different contests, therefore, Empire tires have been used without a single puncture, as follows: Motor Club of Harrisburg, 690 miles, two cars; Norristown Automobile Club, 374 miles, two cars; New Jersey Automobile and Motor Club, 193 miles, one car; Delaware Valley endurance run, 158 miles, nine cars; run-off of Delaware Valley tie, three cars; Catskill-Berkshire tour, two cars.

Locomotive Wins Hill Climb Abroad—It is always gratifying to Americans to learn of instances where American cars beat foreign made machines in competition on the latter's own soil. At the Call d'Aspin Mountain climb in the Pyrenees, France, on June 3, a distance of 93 kilometers, nearly 60 miles, Z. K. Graham of Los Angeles, Cal., who is touring Europe in his Locomobile "40," won a signal victory, beating his nearest competitor by more than 20 minutes. Among the contenders were a Mercedes, two Panhards, a Wolseley, Hotchkiss, Renault and Gladiator. Mr. Graham's car was the only American contender.

"The Q M S Company" a Simplified Name—In order to simplify details in connection with correspondence, telephoning, etc., the Quincy, Manchester, Sargent Company, Plainfield, N. J., has changed its name, and hereafter will operate under the corporate name of the "The Q M S Co." This change has been under consideration for some time, many friends and customers practically demanding it, one great objection to the old name being the inconvenience and time consumed in pronouncing the full name over the telephone, according to factory officials.

KisselKars in Demand—This season's sales of KisselKars, according to the Kissel Motor Car Company, have been so far ahead of the best expectations that additional manufacturing space has become necessary, and some increases have already been made. The selling territory has been greatly expanded, new agencies arranged, and the factory has



How the Timken-Detroit Plant will Look When Doubled in Size

been rushed to supply the demand. One telegram is given as coming from a California agent, as follows: "Ship by carloads as fast as possible until told to stop." The company engineers are busy planning the 1910 models and predict some interesting announcements.

Atwater-Kent Again Enlarges—The Atwater-Kent Manufacturing Works, Philadelphia, maker of the well-known Atwater-Kent Spark Generator and Unisparker, is again doubling its capacity, this being the second expansion which this concern has undergone in eight months. The change was made necessary by the fact that the Atwater-Kent Manufacturing Works will supply twelve new concerns this year with ignition goods as standard equipment, and it became imperative to secure quarters for more workmen and more machinery.

Standard Sales Company Introduces New Plug—To introduce its new spark plug, which is suitable for either magneto or battery, the Standard Sales Company, Broadway and Fifty-seventh street, New York, has arranged to send a sample plug to any address for 25 cents. The concern takes this method in order to get the plugs into the hands of the owners, and it is necessary for the sender to give the name of his supply house and also to state the thread desired.

Regal Company Erects Addition—The Regal Motor Car Company, of Detroit, is constructing a large increase to its plant at Beaubien and Trombly streets, so that its capacity for 1910 will be 3,000 cars. The concern has recently been incorporated.

Georgia Buggy Company to Build Autos—The Dublin Buggy Company, Dublin, Ga., has increased its stock by \$50,000, and will add the manufacture of automobiles. A one-story brick building, 80 by 200 feet in size, will be erected.

Will Manufacture Automobile Wheels—The West Chester Wheel Works, of Chester, Pa., is to add another department to its plant and will manufacture automobile wheels in it, beginning in about a month.

TIMKEN-DETROIT AXLE CO.

CANTON, O., June 21—For the fifth time in seven years the business of the Timken Roller Bearing Axle Company

has doubled, and this time the greatest move in the history of the concern has been made. By dividing the manufacturing of roller bearings from that of making automobile and other axles, an enlarged output in both branches has been secured. The Timken-Detroit Axle Company has been formed and capitalized at \$1,000,000 to manufacture the axles in Detroit, while the plant in this city will hereafter be known as the Timken Roller Bearing Company, and will produce roller bearings exclusively. Machinery is now being installed in the local factory which will just double its present capacity.

In Detroit, large and modern buildings on Clark avenue and the Pere Marquette Railroad were secured some months ago and prepared for occupancy. The drop-forge plant was increased and other improvements made so that the output of axles will be one of the largest in the country. Ample facilities and capital are at hand, and a great deal of business has been booked for 1910. The officers of the Detroit company are: President, W. R. Timken; first vice-president, H. H. Timken; second vice-president and factory manager, A. R. Demory; secretary and treasurer, E. W. Lewis; chief engineer, H. W. Alden; assistant secretary, F. C. Gilbert; purchasing agent, W. H. H. Hutton, Jr. The active management will be in the hands of Messrs. Demory, Lewis and Alden. Operations have already commenced, and in July the full product of the concern will be coming through.

SHANKS A REAL ESTATE

Considerable surprise has been expressed in automobile circles by the announcement of Charles B. Shanks, one of the most successful men in the advertising and sales ends of the industry, of his intention of entering the real estate business in Spokane, Wash., in connection with Fred A. Jacobs, the largest operator in that section of the country, the firm to be called the Jacobs-Shanks Company. Mr. Shanks is at present sales and advertising manager of the F. B. Stearns Company, Cleveland, and he will leave that concern about August 1. He entered the automobile business ten years ago as publicity and advertising manager of the Winton Motor Car-

riage Company, later being advanced to the sales managership, and one year ago resigned to organize a company to retail automobiles in Cleveland. When that was well under way he transferred the management and took up his present position with the Stearns Company.

PERSONAL TRADE MENTION

Charles Stein, of the Stein Double Cushion Tire Company, Akron, O., is now taking full charge of the pneumatic tire department of his company, and will hereafter spend the greater portion of his time in placing agencies throughout the country. Mr. Stein is the inventor of the Stein tires as well as a number of improvements in the construction of solid tires, and is known as an expert in the rubber business.

E. LeRoy Pelletier, one of the most prolific producers of live copy in the automobile world, and whose energies of late have been directed toward exploiting the E-M-F car has, under the new arrangement whereby the Studebaker Company takes over the E-M-F product, been made assistant to the general manager, of the Studebaker Company and also director of sales and advertising manager.

B. E. Brown, of Pittsburgh, has been appointed district manager of the Helios Manufacturing Company branch in that city. The Helios company, of Philadelphia, is the manufacturer of storage batteries for ignition and electrical vehicle purposes, and in a Woods car made a run of 152 miles on one charge to Atlantic City and back.

J. J. Evans has resigned the general sales agency of the automobile department of Abendroth & Root Manufacturing Company, of Newburgh, N. Y., the makers of Frontenac cars.

TAXICAB AND TRANSIT

Another Auto Line to Gettysburg, Pa.—With which to establish an automobile line between Thurmont, Md., and Gettysburg, Pa., two large autos have been received at the former town, each of 30 horsepower and with seats for 12 passengers. One car will be run between Thurmont, where it will connect with the Washington, Frederick and Gettysburg railroad, and Emmitsburg. The other car will run between Emmitsburg and Gettysburg, the two machines meeting in the former town.

Baton Rouge, La.—It is likely that a line of automobiles will be put on by the Baton Rouge & Hammond Railroad, connecting Covington, Hammond and Baton Rouge. At present the only train is a mixed freight and passenger, which is slow and unsatisfactory, but the company claims that the cost would prohibit running another train for passengers only and is considering the establishment of a motor-driven train, or automobiles mounted upon railroad wheels.

Pittsburgh, Pa.—The Wells Fargo Express Company is about to try automobile truck service in this city, and if its success is proved, will extend it to every city in which the concern has an office. The American Express Company, which has been using trucks in some places, has not tried them here because of the heavy grades. It admits, however, that the horse must soon go because of the increasing business.

Boston—The Malden Auto Express Company has bought the business of the Benjamin & Vaughn Express, which has been running an express business between Boston and Malden. Five trips a day will be made by the machines and wagons of the new company, and a local car will be used in Malden. J. Frank Vaughn, of the older concern, is senior member of the new one.

Great Western Taxicabs in Chicago—The Model Automobile Company has entered into an agreement with its Chicago dealers to place Great Western cars in taxicab service in that city.

IN AND ABOUT THE AGENCIES

Firestone, Seattle, Wash.—The Firestone Tire & Rubber Company will open a direct Seattle factory branch on July 1, to care for a greatly increasing trade in the Northwest. The establishment will be at 918 East Pike street, and is the tenth branch to be opened. The Firestone company also has 25 general distributing agencies for Firestone tires and demountable rims.

Packard, Philadelphia—Plans have been prepared for the Keystone Motor Car Company for the addition of three stories to its four-story building on North Broad street. When this is completed the Quaker City agent for the Packard will have one of the largest local automobile establishments in the world.

Peerless and Pope-Hartford, Detroit—The J. H. Brady Auto Company, agent for the Peerless and Pope-Hartford automobiles, has removed to its new building at Jefferson avenue and Beaubien street. This company has secured the agency for the Hudson cars.

Regal, Detroit—The Regal Motor Sales Company has moved to its new garage at Alexandrine and Woodward avenues. It has recently been incorporated.

NEW AGENCIES ESTABLISHED

Chalmers-Detroit: Fort Worth, Tex.—Runnels Auto Company, Second and Throckmorton streets.

Great Western: St. Louis, Mo.—The Albert Sterne Motor Car Company, 4130 Olive street.

Interstate: St. Louis—Lindsay Motor Car Company, 419 North Euclid avenue.

Rider-Lewis: Bellefontaine, O.—M. E. LeSourd, 300 Columbus avenue, east.

Mitchell: Waycross, Ga.—Gilbert M. Younglove, LaGrande building.

Rider-Lewis: Savannah, Ga.—Hazzard & Brocket, 320 Broughton street.

Pope-Hartford: Chicago.—Joseph Deibler, for the State of Illinois.

Rider-Lewis: Hackettstown, N. J.—J. W. Dalrymple.

Middleby: Newark, N. J.—M. and M. Auto Company.

Moon: Tampa, Fla.—Wilson, Trawick & Denham.

Lozier: Pittsburgh, Pa.—Banker Brothers.

RECENT INCORPORATIONS

Tribe Automatic Headlight Company, Worcester, Mass.—Capital \$200,000. To manufacture and sell headlights for automobiles, locomotives and street cars. President, Charles F. Pharaoh; treasurer, George T. Tribe; clerk, Edmund R. Cummins.

K. E. Auto & Electric Company, Birmingham, Ala.—Capital \$10,000. To deal in automobiles and electrical supplies, and to do repair work. Officers: President, Kyle Elliott; vice-president, T. G. Erwin; secretary and general manager, L. C. Kyle.

Consumers' Auto Supply Company, Pittsburgh, Pa.—Capital \$25,000. To manufacture, sell, and deal in all kinds of supplies for

automobiles. Incorporators: E. C. Neagley, M. L. McKain, B. L. Stonecker. Delaware corporation.

Philip C. Traver Manufacturing Company, Far Rockaway, N. Y.—Capital \$50,000. To manufacture accessories for automobiles, bicycles and carriages. Incorporators: Philip C. Traver, Lewis Pearsall, George Breng.

Memphis Taxicab Company, Memphis, Tenn.—Capital \$100,000. To operate taxicabs and other automobiles. Incorporators: S. M. Neely, N. C. Perkins, E. B. Le Master, G. G. Albon, S. H. Trezevant.

Plainfield Auto Bus Company, Plainfield, N. J.—Capital \$50,000. To operate automobiles and other automobiles. Incorporators: A. R. Force, A. Tepper, M. Mendel, F. C. G. Martin.

Custead Motor Vehicle Company, New York.—Capital \$100,000. To manufacture automobiles, etc. Incorporators: William D. Custead, Charles F. Di Dion, Arthur M. Von.

Carthage Automobile Company, Carthage, Miss.—Capital \$10,000. To operate an automobile line between Canton and Carthage. Incorporators: R. L. Jordan, J. A. Walker.

New York & Queens Auto Truck Company, New York City.—Capital \$10,000. To operate buses and trucks. Incorporators: E. J. Forham, H. H. Browne, J. J. Harper.

E. R. Thomas Motor-Branch, Buffalo, N. Y.—Capital \$100,000. To deal in automobiles. Incorporators: Edwin L. Thomas, J. M. Edsall, M. E. Dirnberger, Jr.

Regal Motor Car Company, Detroit.—Capital \$100,000. To manufacture automobiles. Incorporators: Charles E. Lambert, John E. Lambert.

Maxwell-Briscoe Motor Company, Detroit.—Capital \$1,500,000.

NEW TRADE PUBLICATIONS

Electric Welding Products Company, Cleveland—Two booklets have been issued by the Electric Welding Products Company illustrating their finished steel bolts and screws, and their valve stems and other electrically welded materials. These books are handsomely gotten up, with fine typography and clear cuts, and thus altogether attractive. They treat of the methods of welding the products, as well as the reasons for using these in preference to cutting down bolts, etc., from solid stock. Valves may be made by this process with nickel steel heads and carbon steel stems, and brake or gear shifting levers of steel with brass or bronze handles. The books are intended for the automobile trade, dealing with products used in the construction of the cars.

Continental Caoutchouc Company, New York City—Buff-colored folders, containing five photographs showing the different operations necessary in removing and replacing a deflated tire on a Continental demountable rim, have been issued by the Continental Caoutchouc Company. These are being sent to every automobile club in the country, and are artistically and neatly gotten up.

PARTRIDGE BEEFSTEAK DINNER

NEW YORK, June 21—As a farewell dinner before starting upon a vacation tour to Europe, E. S. Partridge, of the firm of Wyckoff, Church & Partridge, last Thursday evening gave a genuine "beefsteak" repast to more than a score of prominent New Yorkers. The gathering was at Luchow's in true Bohemian fashion, and with white aprons and hats on the host and guests, the steaks were served upon big kegs instead of the conventional tables. Those present were: E. S. Partridge, Judge Loren Zeller, Percy Yalden, J. E. Demar, B. F. Nathan, J. P. Goodwin, August Luchow, G. T. Stockham, E. Gibbs Murphy, George Rector, George Johnson, A. Weiss, James Chism, I. H. Manning, C. W. Wurster, H. M. Swetland, Oscar Warner, Arthur Lesser, C. G. Drum, Howard Drakely, G. H. Gantert, Alex. Dow, Morris Rothchild, A. W. Church, Arthur Hildebrand, Guy Vaughn, S. C. Carrie, H. E. Wagner and A. J. Pickard. As a mark of their esteem, the W. C. P. force presented Mr. Partridge with a fully equipped and very handsome traveling case.

Mr. Partridge sailed on Saturday and will be away about six weeks. He took with him a Stearns touring car equipped with Continental tires and a new model of the Warner instrument. With the car he will tour in England and upon the Continent and may establish agencies in London, Paris and Berlin, in answer to many queries received from Europe during the past year as to the Stearns product. One of the interesting news items which appeared at the dinner was that the third 1909 series of Stearns cars will contain some real surprises, and that the first will be ready for delivery by August 1, at which time Mr. Partridge will be back to supervise the distribution of the fall and winter allotment. During the past year the company has sold in this city and the East more than twice as many cars as it did the previous year and would like to have had more cars to sell. During the coming year, however, the firm has determined not to be caught napping and has already placed blanket orders to ship as many Stearns cars as the big Cleveland factory can produce for the eastern territory. The new yellow taxicabs have been very satisfactory.



When the Guests Surrounded the Festal Board at the Recent Partridge Beefsteak Dinner

Information for Auto Users

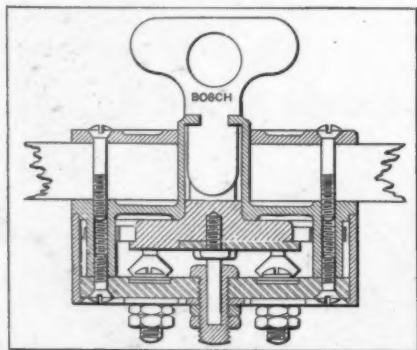
Grade Percentage Indicator—There is but one standard for the measurement of grades, the rise in 100 feet, which, of course, is also the per cent. Every grade meter should read in terms of this, so that different slopes may be compared intelligently, although it is a fact that many of them do not. A new measuring instrument, known as a gradometer, has this as the principal feature. Not only does this new instrument measure and indicate the percentage of



KIPLING
GRADOMETER

the grade, but it indicates to fractions of 1 per cent. just as delicately as the higher amounts. The exterior form of the instrument is very pleasing, and, to prevent cheap copies being made, the makers have registered the shape. It is of highly polished brass, measuring 7 inches in height, with a 2½-inch dial. The latter is silvered to make the letters read more plainly. The method of attaching it to the dashboard, the only place for such a handy and handsome instrument, is by means of screws, three being necessary. It is made abroad and sold in this country by Samuel Buckley & Company, 225 Fifth avenue, New York City.

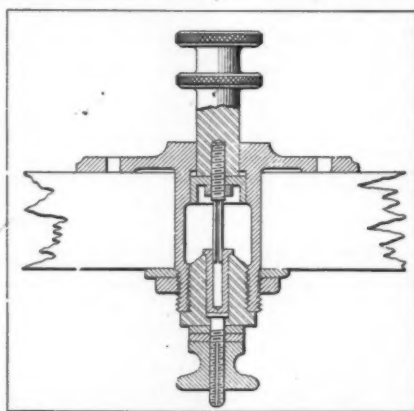
A New Ignition Lock—The name of Bosch has always been associated with articles of merit, and the latest products of the Bosch factory are no exception to this rule. In the key switch designed for use with dual ignition, is found something to fill a long-felt want. This is provided with a large, flat key, which may only be withdrawn when it is perpendicular. In this position the magneto windings are connected to the ground, while the battery circuit is opened. In this way it is impossible to operate the engine. With the key in position, a turn to the left puts the mag-



BOSCH IGNITION LOCKING SWITCH

neto back into business, or a turn to the right allows the use of the battery system. The key is spring-held in any one of the positions, which are regulated as well by stop pins abutting against the posts, to which holding screws are fitted.

A second new product is the dashboard switch. This consists of a large diameter plate, from the under side of which projects a hub. The latter houses the mechanism of the switch and protects it from dirt, dust and injury. Arranged to just project through a one-inch dashboard, this mechanism is very simple. A hard rubber handle is attached to a ferrule, which makes the contact with the body of the switch when the handle is pulled out. At the same



BOSCH DASH SWITCH IN SECTION

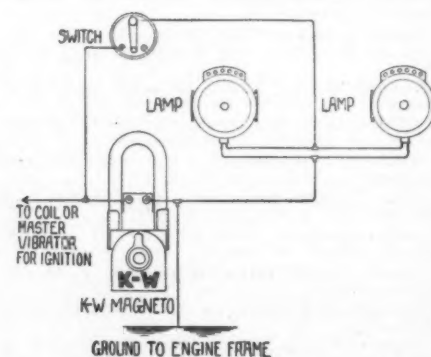
time, the cable attached to the inside end of the ferrule is grounded. Both devices are sold in this country by the Bosch Magneto Company, 223-225 West Forty-sixth street, New York City.

Koen's Folding Table and Chairs—For the use of automobilists, campers, boatmen and others, where a portable chair or table is desired, the Buffalo General Manufacturing Company, Buffalo, N. Y., is marketing the Koen patent folding chairs and table. The chairs are of the revolving, as well as folding type, suitable for tonneau seats or for use in a motor boat. Four kinds are made, with the price depending upon the upholstery or general finish; and one is so designed as to fold up against the side of the car or boat; another to have the back fold upon the seat, mounted upon a pedestal. The table is applicable for places where light lunch is served, for office work and more especially for traveling or camping. It lends itself to ready adjustment and packing.

The Autoist's Rabbit Foot—Strange as it may seem in a non-superstitious people, there is at present an unprecedented demand for good luck emblems. To meet this demand all of the leading dealers are laying in large stocks of the various lucky charms now made. The Motor Car Equipment Company, 1727 Broadway, New York City, is going into this line very extensively, and in addition to Gobbo, "The God of Good Luck," is making up a number of emblems of dif-

ferent fraternal orders in various shapes and suitable for radiator caps. These include the emblems of the Masonic fraternity, Elks, Woodmen, Knights of Columbus, and many others. They are put out in all finishes, 24-karat gold, silver, and antique brass.

K-W Magnetos to Supply Electric Lights—Automobilists are always glad to hear of a simple method of lighting their lamps by electricity, especially from a source which does not add complications. The K-W Ignition Company, Cleveland, O., manufacturers of the K-W magneto, announces that after extended experiments the K-W magneto has proven itself suitable for ignition and lighting purposes at the same time. Connections are made, as shown in the illustration, to electric bulbs in the searchlights, and the switch is located wherever convenient, but the lighting system is entirely distinct from that furnishing ignition. The company states that the tests failed to show any depreciation of the ignition current when the lights were turned on, and that the lights are also of ample power for use in the large searchlamps. In discussing the new system J. A. Williams, president of the company, says: "We have known that the K-W magneto would run lights successfully, in addition to ignition, but we have been conservative, and have made lengthy tests which have satisfied us that a combination is practical and we guarantee it. There is ample current to furnish both lights and ignition at the same time, and when the electric light is placed in a parabolic reflector the rays are thrown straight ahead and concentrated, so as to light objects several hundred feet away. When the motor is slowed down there is a slight variation in the light due to the change of speed, but it is very slight, and not enough to figure. The lights, on the other hand, do not have any effect upon the ignition, provided that the proper lamps are used. Another feature of the magneto is that the nature of the alternating current with the principle of the armature re-



K-W MAGNETO ELECTRIC LIGHTING SYSTEM

action keeps the voltage within very close limits. Six-volt tungsten lamps of a capacity that will draw about five amperes as a total load are the best. If one lamp is used it should draw not more than five amperes; if two lamps are used, we suggest that they should be two and one-half ampere lamps; while for motorboats we would advise the use of one two-ampere lamp and three one-ampere lamps. The lamps should in any case be tungsten types, which give three or more times as much candle power as the ordinary carbon lights."

AUTOMOBILE

Vol. XX.

JUNE 24, 1909

No. 25.

GRAY & DAVIS

1910
**CLOSE
COUPLED
LAMP**

**MADE IN
ALL SIZES**

**DESIGN PATENT
APPLIED FOR**

We will show on this page, three weeks from to-day, a picture of our new model Close Coupled Gas Lamp. The Gray & Davis double lighting feature will be the same, with improvements and refinements, and to those who want lots of light at night it will be a revelation.

The outside shell and hood of new and pleasing shape, we have worked on for several months and have succeeded in making a smooth, plain lamp, with all unsightly screws and rivets concealed. This makes a rich looking lamp, easy to clean and that does not catch the dirt.

GRAY & DAVIS
AMESBURY, MASS.

STROMBERG CARBURETORS

THREE REASONS WHY STROMBERG CARBURETORS ARE THE BEST

Power

A perfect mixture at all speeds is absolutely necessary in order that a motor may develop its maximum horse-power. On account of the design and control of the auxiliary air valve in a STROMBERG CARBURETOR, a perfect mixture is certain on any speed. For this reason the motor will give excellent service, equally well on low, intermediate or high speeds.

Speed

The design of the STROMBERG CARBURETOR compels it to automatically clear itself, and never allows it to become choked or filled when properly adjusted. This one thing alone means greater speed than any other; not only ability to retain high speed, but to speed up quickly after being slowed down.

Simplicity

There is only one absolute adjustment on a STROMBERG CARBURETOR, and that is to set the auxiliary air valve first for low speed with the knurled adjusting nut underneath, then for high speed with the nut above the valve. After a STROMBERG CARBURETOR is once adjusted it needs no further attention. Adjustments are self-locked.

MADE TO FIT ANY CAR

ORDER ONE FOR YOUR CAR TO-DAY

Catalog No. 1 describes and illustrates in detail. Send for it to-day

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"SPECIAL"



"OFFSET"



"ROUND"



The justly
CELEBRATED
8-Day, High-Grade

"CHELSEA" AUTO CLOCK

(Trade Mark)

Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest. Used by parties demanding the BEST.

ALL SIZES STATED ARE THE APPROXIMATE DIAMETERS OF THE DIALS.
All are 8-day High-Grade. All are in DUPLEX (patent applied for) polished cast brass cases, the most thoroughly water-proof case on the market. The "SPECIAL" clocks show dial on an angle; its inner cased clock when removed from outer (locked) case is excellent for use on mantels, bureaus, etc., when touring; its outer case is screwed to dashboard by hidden screws. The "SPECIAL" clocks are in large demand from dealers for owners of finest cars.

The MOTOR CLOCK has the same clock movement which for years we have supplied for the hard use on Locomotives, Steam Fire Engines, etc.; its dial is of same appearance as the AUTO Clock dial, but the Auto Clock movement has a somewhat finer train.

The 3 1-2 MOTOR "OFFSET" is likely to prove a quick, ready seller. Very attractive.

PRICE LIST

Size	"Round"	"Offset"	"Special"	"Limousine"
2 3-4-inch Auto Clock	\$26.00	\$28.00	\$36.00	\$28.50
3 1-2-inch Auto Clock	28.00	30.00	46.00	
3 1-2-inch Motor Clock	24.00	26.00	41.00	

"Chelsea"

YOU want
the BEST?

CHELSEA CLOCK CO., 16 State St., BOSTON, U.S.A. Ask for the "CHELSEA"

Largest makers in America of exclusively 8-Day—High-Grade Clocks—Mantel, Marine, Office, Ship's Bell Clocks, Auto Clocks, etc.

"LIMOUSINE"



Primarily intended for use inside the bodies of large enclosed cars, and for such use its case can be given a variety of fine finishes. It also makes an attractive clock for use on dashboards. Only made in 2 3-4-inch size.

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34x4½	19.00	30x3	10.00
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Parts and Accessories

(WANTED)

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Four-cylinder shaft-driven runabouts to sell for \$750 or under.

Runabout and touring cars to sell for \$850 or under, four-cylinder, shaft-driven.

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Must be in 60-inch tread and 1910 models. Enclose specification and address "Distributor," care The Automobile.

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(Special Notices continued on page 48)

(Special Notices continued from page 47.)

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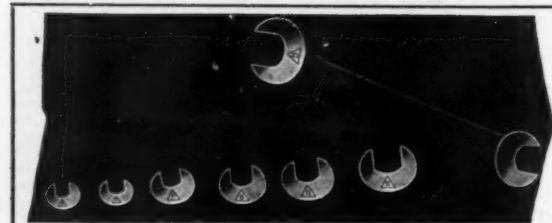
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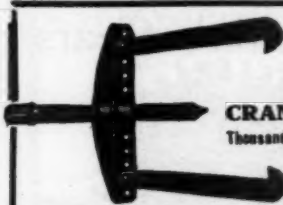


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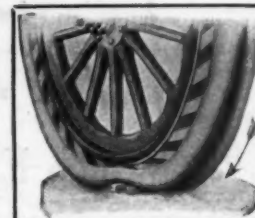
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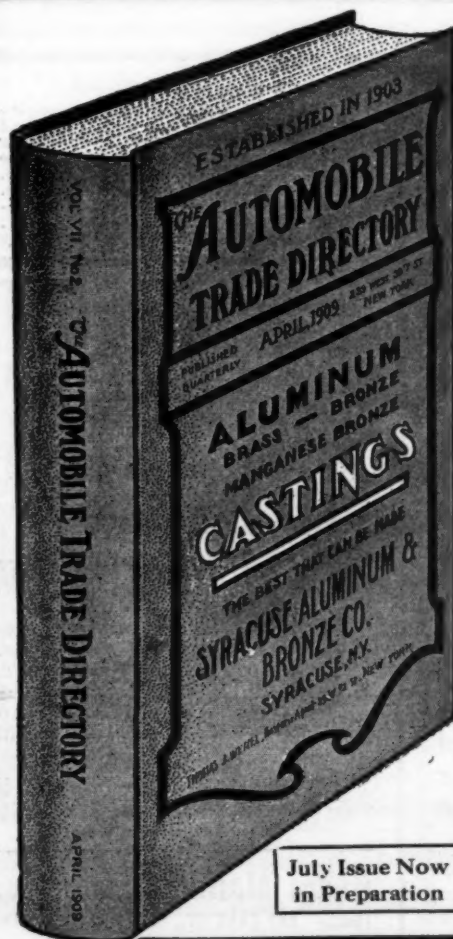
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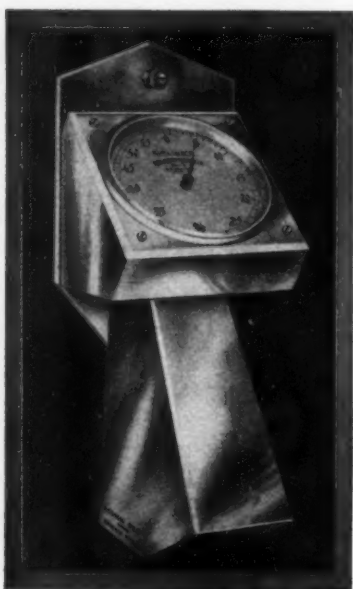
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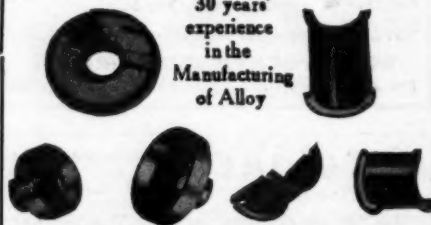
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31 x 4	32.50	18.00	6.65	4.50
32 x 3	16.80	10.50	4.15	3.25
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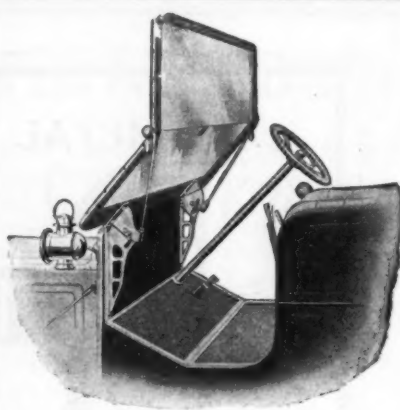
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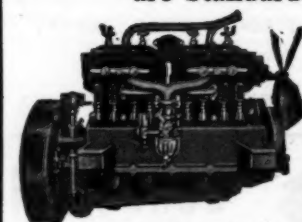
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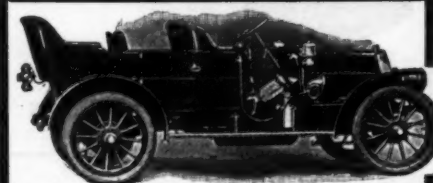
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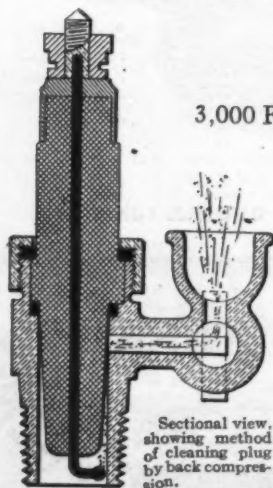
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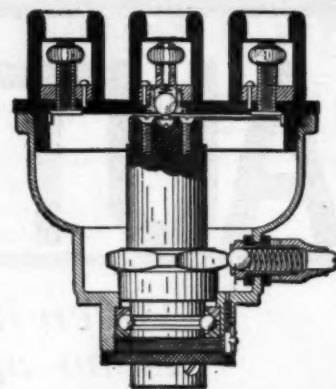
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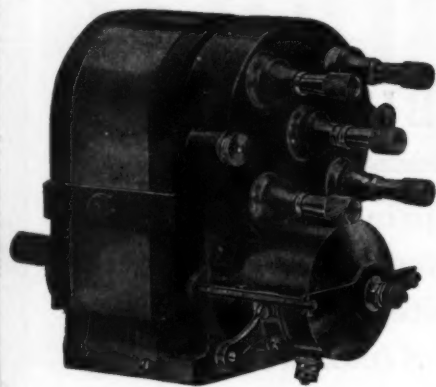
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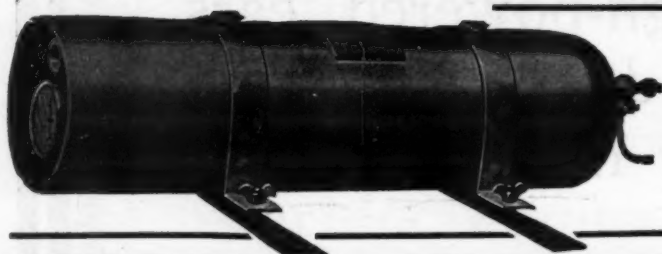
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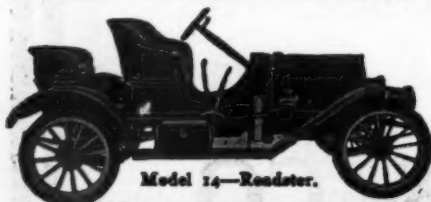
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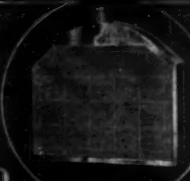


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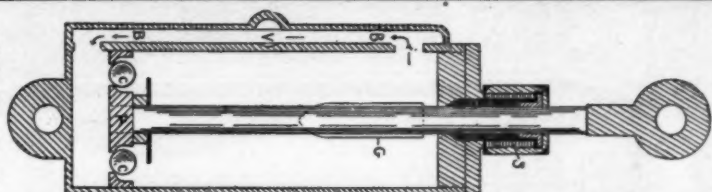
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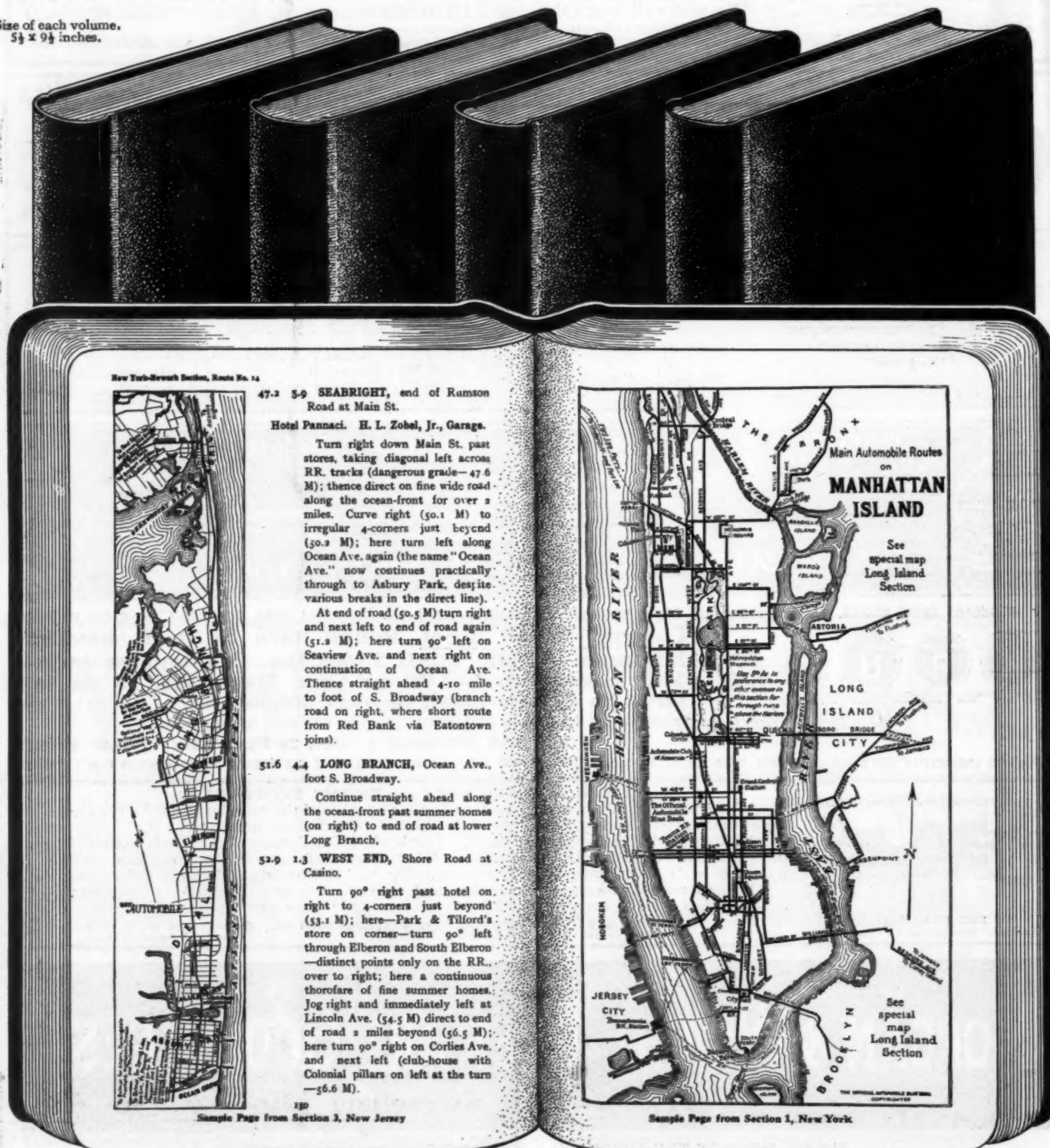
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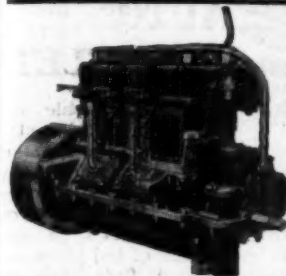
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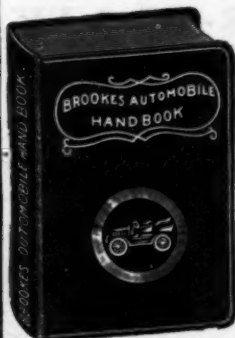
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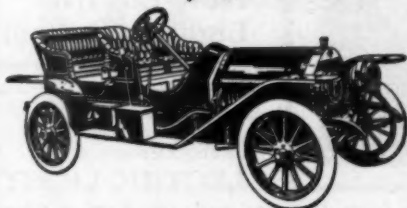
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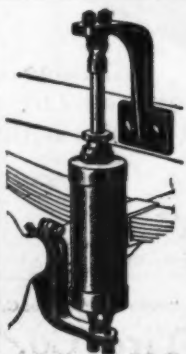
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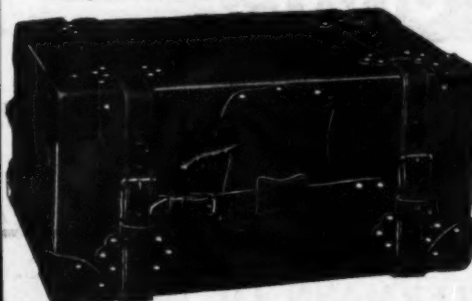
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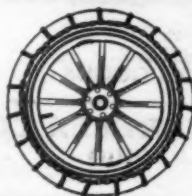
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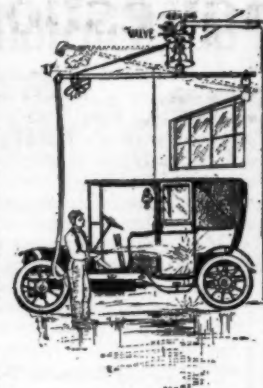
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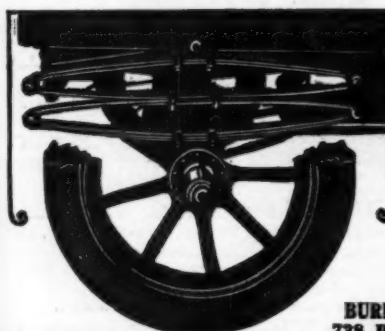
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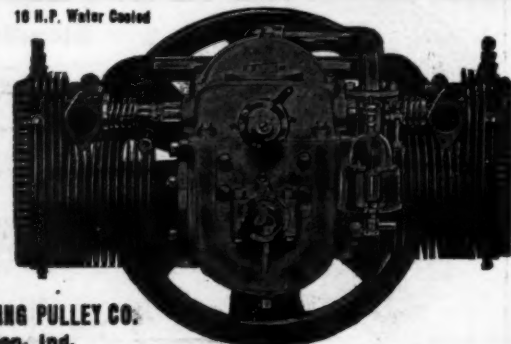
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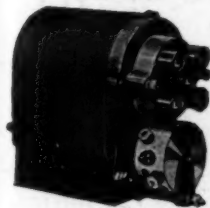
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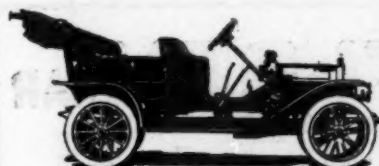
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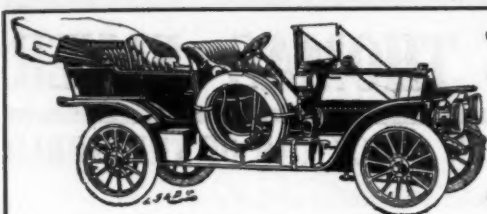
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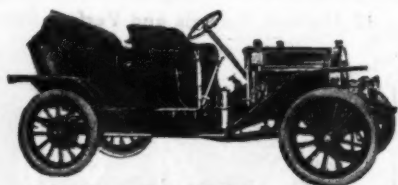
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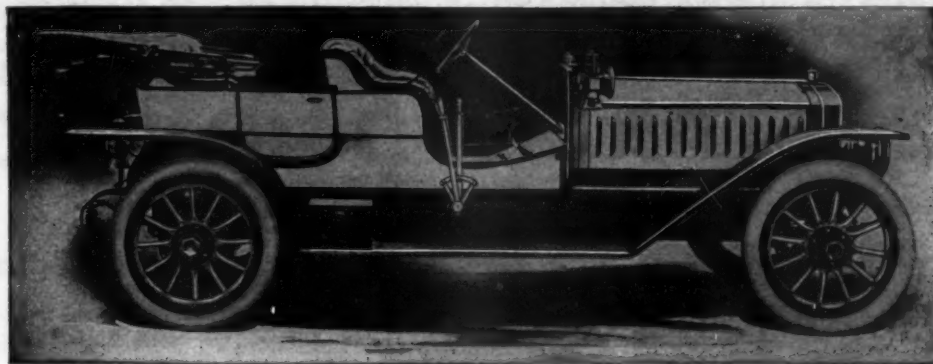
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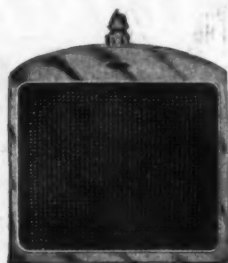
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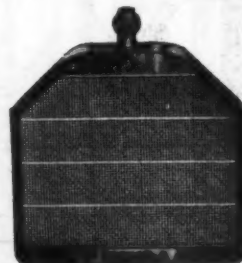
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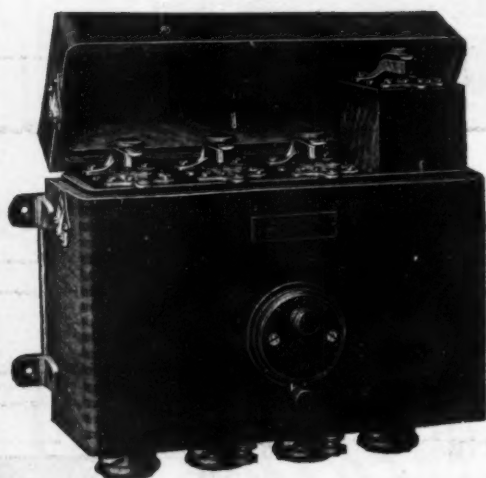
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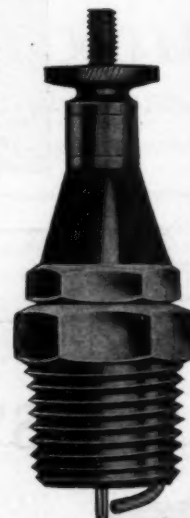
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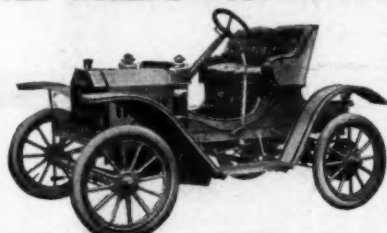
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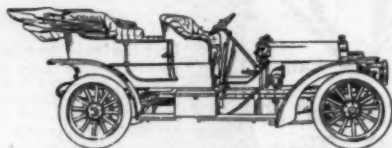
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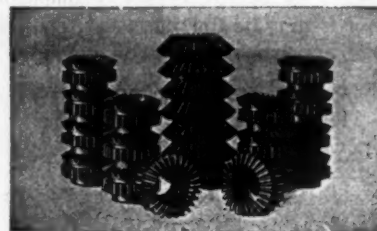
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If you were an Electrical Engineer you'd never let your new car come to you with Storage Batteries for Reserve Ignition.

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"You Screw the Battery In
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When the garage employees use your car or run the engine without load while standing on the washing platform who pays for the gasoline and the lubricating oil consumed? When they idly run the engine and clog the cylinders and valves with carbon deposits, who pays to have the engine taken down and the carbon cleaned out? When some one gets away with your car after you have left it standing at the curb, at whose expense is it recovered and who pays for the necessary repairing?

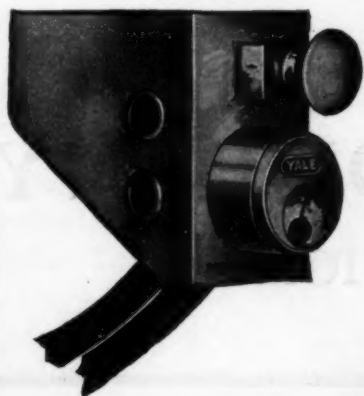
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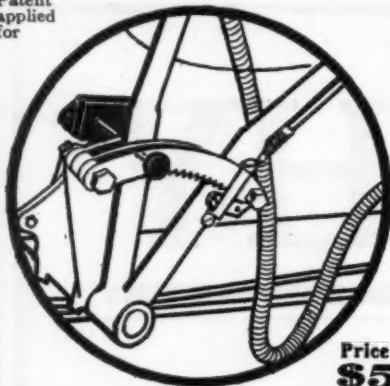
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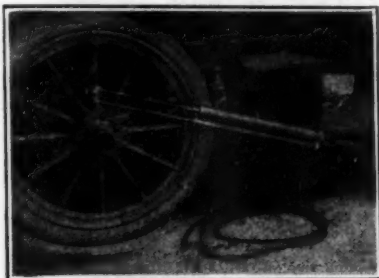
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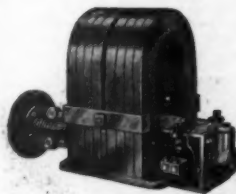
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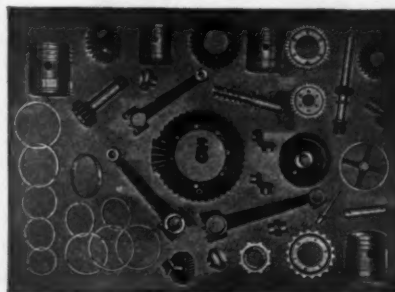
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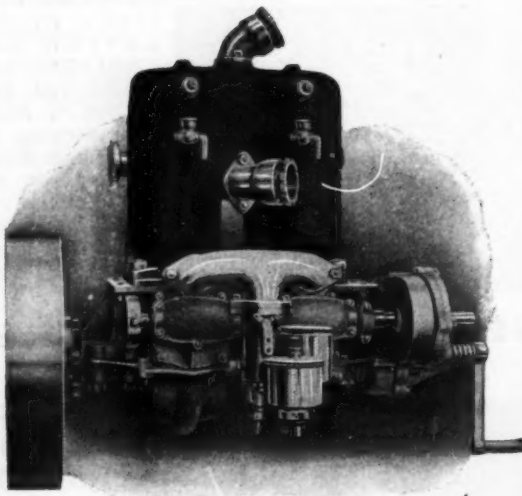
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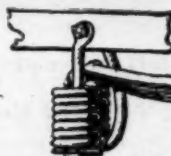
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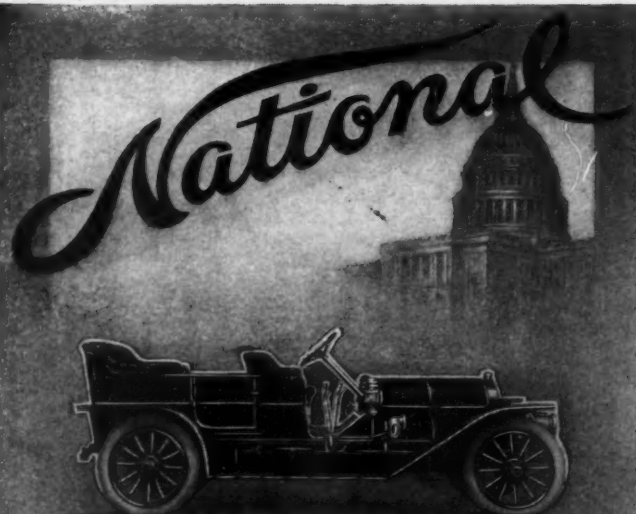
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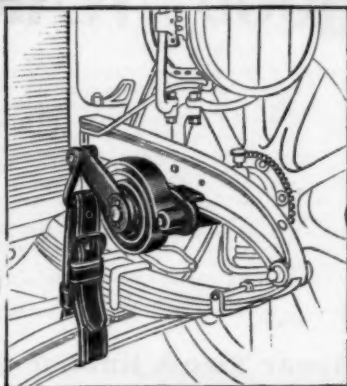
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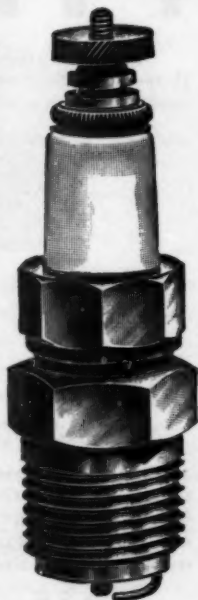
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We have been manufacturing the well-known Miller Mica Spark Plug for the past five years, and it has proven to be one of the most serviceable and satisfactory plugs on the market. There has, however, been a constant demand for a first-class Porcelain Plug. On account of the demand for a Porcelain Plug we have done considerable experimenting, the result of which is the Spark Plug illustrated. We have arranged to manufacture this plug in large quantities and in this way have reduced the cost of manufacturing the Plug, and we offer one of the best Spark Plugs on the market at a low price. The material and workmanship are the finest on the market and are guaranteed



Price, $\frac{1}{2}$ inch Pipe Thread or
Metric Thread.....\$0.75 each
Porcelain only......20 "

CHAS. E. MILLER

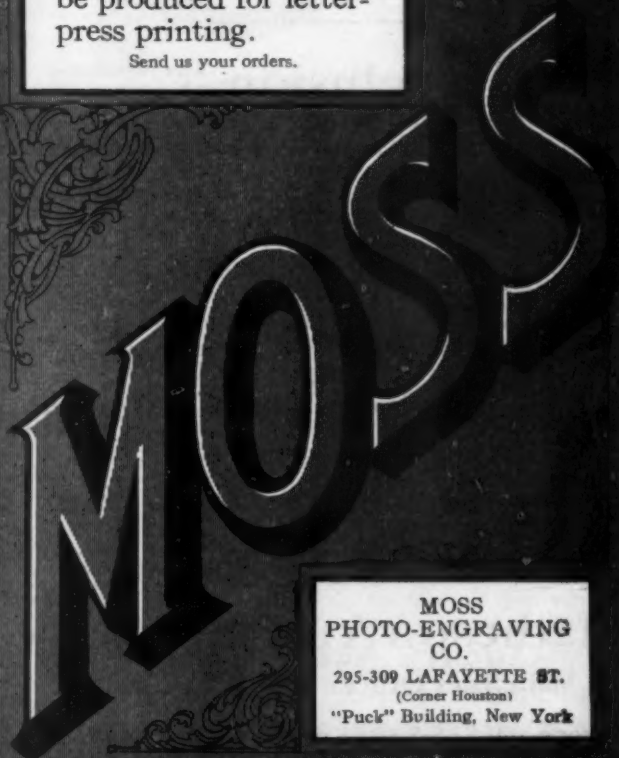
Manufacturer, Jobber, Exporter and Importer

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As perfect cuts as can
be produced for letter-
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Matheson

RECENT VICTORIES

FIRST AND SECOND

IN WASHINGTON-HAGERSTOWN 168 Miles
Sealed Bonnet Contest, May 15th, 1909, Winning
Washington Post Cup, against a field of 18 con-
testants.

PERFECT TIME AND ROAD SCORES

IN NORRISTOWN-HAGERSTOWN 400 Miles
Endurance Contest, May 18-19, 1909, against a
field of 32 contestants.

TWO MORE PERFECT SCORES

IN NEW YORK-BOSTON 247 Miles Endur-
ance Contest, March 11th, 1909, against a field
of 20 contestants.

FIRST, SECOND and THIRD TIME PLACES

IN PHILADELPHIA - WILKES-BARRE 300
Miles Mid-Winter Contest, against a field of 32
contestants, January 1-2, 1909, **only three of
the 32 cars had perfect scores and**

THOSE THREE WERE MATHESONS

The Conclusion The Matheson Car
has proved in every
contest it has entered that it is far and away the most re-
liable and serviceable, as well as the most economical and
the fastest touring car in the world.

50 H. P. Six Cylinder Shaft
Drive, **\$3,000**
Equipped with choice of Touring, Tourabout, Toy Ton-
neau, Close Coupled or Runabout Bodies.

50 H. P. Four Cylinder Chain
Drive, **\$5,000**
Equipped with Touring Body.

Limousine or Landaulet, **\$5,750**
Roadster or Tourabout, **\$4,750**

Matheson Automobile Co.

Main Sales Office: 1886-1888 Broadway

Factory: WILKES-BARRE, PA. NEW YORK CITY

HOW TO AVOID TIRE TROUBLES

To-day automobile troubles are largely tire troubles. Eighty per cent. of up-keep expense is tire expense. When you are tied up on a lonesome road 20 miles from nowhere—nine cases out of ten it's TIRES.

—And nine cases out of ten the blow-outs which waste money and kill pleasure were caused by *overloading*.

—Tops, glass fronts, gas tanks, searchlights, extra seats (an invitation for more passengers), storage batteries, extra casings and pounds of luggage are added to large and small cars alike.

—Before you know it your tires are carrying from 200 to 300 lbs. more than they were *ever built to carry*. The result is certain, quick destruction—heavy expense—trips of trouble instead of pleasure—and a world of humiliation for the man who owns the car. Rubber, strong as it is, has its limitations.

GOOD YEAR

Goodyear Automobile Tires overcome these conditions because EVERY SIZE IS OVERSIZE. They are full 15% larger than any other automobile tire in the market sold for the same size. A Goodyear 4-inch tire measures almost 4½ inches. If a set of tires of another maker will safely carry 2,000 lbs., Goodyear Tires of the same size will with equal safety carry 2,300 lbs.

But even if your tires are ample for their load—even if your car is not weighted down with accessories—think what the extra 15% means to you as a "margin of safety," to say nothing of comfort.

Every bit of material in the car you drive has a "margin of safety" of 5 to 7—it must be capable of bearing a strain 5 to 7 times greater than it will ever be subjected to. Tires alone are expected to work to the limit of their resistance. When you overload them there is no "margin of safety." It has been exceeded. You are taking chances every minute you drive.

Think carefully what this 15% oversize (to be secured only in Goodyear Tires) means to you.

To know all the good points of this wonderful tire, write for our helpful book, "How to Select an Auto Tire."

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Branches and Agencies:—Boston, Mass., 261 Dartmouth St.; Cincinnati, Ohio, 317 E. 5th St.; Los Angeles, Cal., 949-51 S. Main St.; Philadelphia, Pa., Broad and Fairmount Ave.; New York City, 64th St. and Broadway; San Francisco, Cal., 506 Golden Gate Ave.; Chicago, Ill., 80-82 Michigan Ave.; Cleveland, Ohio, 2005 Euclid Ave.; Milwaukee, Wis., 188-192 8th St.; St. Louis, Mo., 3935-7 Olive St.; Buffalo, N. Y., 719 Main St.; Detroit, Mich., 251 Jefferson Ave.; Pittsburg, Pa., 5988 Centre Ave.; Omaha, Nebr., 2010 Farnam St.; Washington D. C., 1026 Connecticut Ave.; Atlanta, Ga., 90 N. Pryor St.; Louisville, Ky., 1049-51 Third St.; New Orleans, La., 706-16 Barronne St.; Memphis, Tenn., 181-5 Madison St.; Dallas, Tex., 111 N. Akard St.; Denver, Colo., 28 W. Colfax Ave.; Baltimore, Md., 991 Park Ave.; Kansas City, Mo., 16th and McGee Sts.; St. Joseph, Mo., 316-24 N. 2d St.; Providence, R. I., 366 Fountain St.

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"I get bumped worse than ever since putting on those Shock Absorbers. I should have taken the dealer's advice and put on



FOSTER SHOCK ABSORBERS

which don't throttle the springs, but allow them to act freely on smooth roads and only get busy when we hit the rough spots."

Built on right principle. Free in center and bind gradually going up and coming down.

ASK ANY MECHANIC

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Agents Wanted Everywhere

FOSTER SHOCK ABSORBER

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CLEVELAND, OHIO

The White Line Radiator belongs
to the Stearns

STEARNS

The Stearns Motor Cars

Belong to People who have the Best

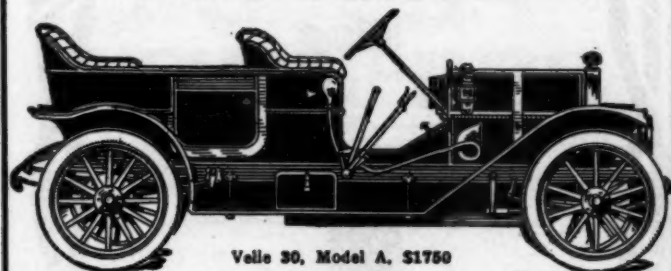
The F. B. Stearns Company

Factory and General Offices,

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Member Association of Licensed Automobile
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"CAR COMING!"



Velie 30, Model A, \$1750

You must see the Velie 30 if you want to know how good a car can be sold for \$1750. Same motor, same transmission, same axles as are used in the best \$2750 cars. Velie design is snappy and graceful—Velie workmanship is highest grade—Velie tests are positive and convincing—Velie guarantee (for one year, not ninety days), is most liberal.

The Velie Line includes touring car, tourabout, roadster with single or double rumble seat and toy tonneau, all with generous equipment.

Dealers and agents who are looking to the future as well as the present, will be interested in the Velie proposition.

Write for Catalogue

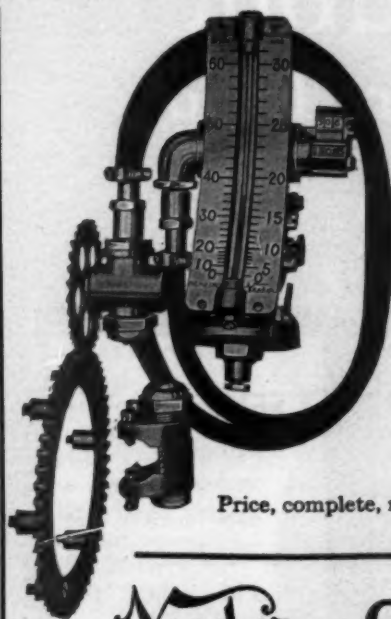
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Veeder Tachodometer



The most scientific and complete
speed recording
device of the age

The only permanently accurate speed indicator in the world.

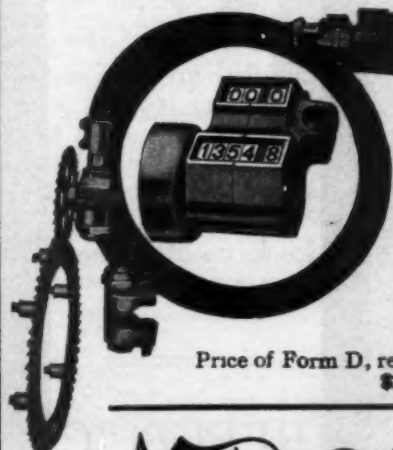
Registers how far, total, and for each trip and shows exact speed at all times, in plain, readable figures, from zero to 62 miles an hour.

No springs, magnets or other variable elements. No delicate mechanism. Only one moving part. Ball bearing throughout

Price, complete, ready to put on any car,
\$50.00

Veeder Odometer

Form D



This instrument goes on the dash and has two registers, the upper being a trip register which may be set to zero at will, while the lower keeps a record of the total number of miles traveled.

Veeder Odometers and Tachodometers are adaptable to any car and are acknowledged the best made. "Veeder" were an established success before the inferior imitations were even thought of.

No speedometers have ever equalled the "Veeder" in any feature.

Price of Form D, ready to put on any car,
\$20.00

Veeder Odometer

Form B



Same style and quality as above instruments, except this is intended as a single trip odometer and attaches to the steering-arm, making an accurate record of the number of miles traveled.

Like all Veeder products, this type of odometer is exceedingly popular because of its high efficiency and low price.

Price of Form B, ready to put on any car, **\$10.00**

In your own interest get full particulars. See a "Veeder" in operation if you can before buying any other device. *It will pay you*

THE VEEDER MFG. COMPANY

22 Sargeant St.,

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Represented in Great Britain by Messrs. Markt & Co., Ltd., 6 City Road, Finsbury Square, London, E. C., England.

Republic Staggard Tread Tires



HERE is a Tire that gives the full mileage that a smooth tread tire gives and is also an anti-skid when the road is wet. No stopping to put on tire-chains. Other anti-skid tires are so short-lived that they are limited to use in wet weather.

Look up the Stag-gard Tread.

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RUBBER
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Republic Staggard Tread, Pat. Sept. 15, 22, 1908.



The
"Breech-Block"
Plug

\$1 EACH

THE STANDARD COMPANY
TORRINGTON
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"If it's made by H-E-I-N-Z-E
it's right."

SPECIFY

**HEINZE NEW LOW
TENSION
MAGNETO**

ON YOUR 1910 CAR

and get the one that the best posted ignition experts have decided is superior to all others, whether of American or Foreign make

SUPERIOR IN EFFICIENCY

SUPERIOR IN CONSTRUCTION

SUPERIOR IN OPERATION

NOTE

THIS IMPORTANT FEATURE

Will produce perfect ignition at
50 revolutions crank-shaft speed

The superiority of Heinze Coils made for us a reputation second to none in the ignition field, and with that reputation to sustain we offer you in the

**NEW HEINZE
MAGNETO**

absolutely the

MOST RELIABLE

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MOST EFFICIENT

Ignition Apparatus that it is possible to produce. Whether you are the owner of one car or the manufacturer of ten thousand cars, you cannot afford not to investigate our claims.

We issue an elegant loose leaf catalog which we will send upon request, if you will address DESK H,

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Factory and Main Office:

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FISH

offers a cure for all kinds of Ignition Troubles.
For instance here is the

Fish Diaphragm Vibrator Coil Uses 35-100 of one
ampere

All other vibratory coils stick. This one doesn't.

The best of them vibrate 14,000 times per minute. This one over 200,000 times per minute.

The points in all others get dirty. These don't.

All others need adjustment attention. This one doesn't.

Doesn't this mean something to you? It is dust-proof, water-tight and fool-proof.

Use it 30, 60 or 90 days if you choose and if you are not satisfied return it and get your money.

These coils give 100% hotter spark than any coil made.

1 cylinder dash coil..... \$15.00
2 cylinder dash coil..... 24.00

Write for Catalogue of
Multi-Speed System for any
number of Cylinders.

Also See Here!

**The FISH TIMER
NEW and RIGHT**

\$5.00



Patent Applied For.



will not only outwear any other, but will outlive any motor on which it may be used

GUARANTEED

Money refunded if goods are in any manner not as represented.
Is entirely self-enclosed and may be attached to any shaft in either a vertical or horizontal position in a very few minutes.
Prices, adapted to either one, two or four cylinder motors, \$5.00 each.

Liberal Discounts to Dealers and Jobbers.

Immediate Delivery.

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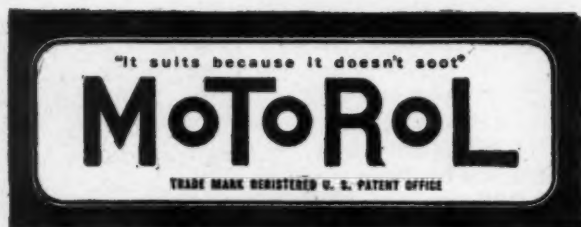
CHICAGO

Develop More Power

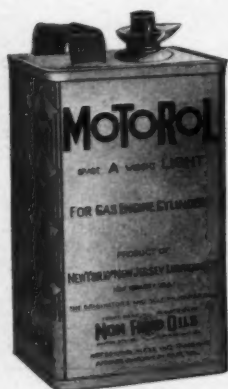
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Buy Less Oil

By Using



for cylinder lubrication. You'll get better results and greater economy.



All carbon interference in your cylinders, such as interruption of ignition and fouling of valves and pistons, tends to materially reduce engine efficiency. On the other hand, some more or less non-carbonizing oils are low in lubricating value and do not prevent wear or promote cool running conditions.

MoToRoL has been refined to meet both requirements—freedom from carbon and high lubricating value. These qualities produce the highest efficiency and economy.

Ask your dealer. If he is not supplied, return attached coupon and secure free sample.

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Originators and Sole Manufacturers of
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Please send me free sample of **MoToRoL**.

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Address..... Car.....

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THE SOLUTION OF YOUR TIRE TROUBLE

isn't in better tires, for the tire makers have "gone their limit" to produce the strongest combination of rubber and fabric.

The Demountable and Quick Detachable Rim is the only logical solution. It is sure to come, and will be as much a part of the future equipment of an automobile as is the magneto to-day. So-called puncture-proof tires, solid tires, tire fillers and the like are but phases through which the automobile industry is rapidly emerging.

DOOLITTLE RIMS

DEMOUNTABLE—QUICK DETACHABLE

will solve your tire troubles just as they have thousands of English and Canadian motorists. Every man who sees it exclaims, "How simple; wonder why it wasn't thought of long ago!" All great inventions are reached by the simplest and most direct methods. Clumsy contrivances are but the natural outcome of a new industry.

WHAT THE DOOLITTLE RIM IS

A set consists of five rims which take any standard make of Clincher or Q. D. tire. The extra rim carries a fully inflated tire. When a puncture or blow-out occurs it takes **LESS THAN ONE MINUTE** to remove the damaged tire complete with its rim and substitute a new and fully inflated tire, mounted on the spare rim.

WHAT THE DOOLITTLE RIM WILL NOT DO

IT WILL NOT rust fast (this has been the one great drawback to all other demountable rims), because, should the rim freeze to the wheel, by our special Doolittle patent we can **EXPAND THE RIM** with a pressure of over ten tons. No rust can withstand this tremendous pressure.

IT WILL NOT damage the tire and rim cutting is impossible.

IT WILL NOT pinch your tubes.

Let us send you our Booklet which fully describes the **DOOLITTLE DEMOUNTABLE—QUICK DETACHABLE RIMS**

TO DEALERS—Now is time for you, Mr. Dealer, to get our special proposition. **DOOLITTLE RIMS** are bound to be one of the great factors in the automobile industry. There isn't a car owner who will not gladly make the change when you demonstrate how simple, safe and what a time saver these rims are. Write us to-day and let us give you full particulars—**DO IT NOW**.

THE DOOLITTLE RIM CO. LIMITED

1666 BROADWAY, NEW YORK
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PLEASE MENTION THE AUTOMOBILE WHEN WRITING TO ADVERTISERS

The Logical Shield For Your Car

MR., MRS., or MISS MOTORIST,
the world is moving forward.
What was good enough yesterday is
not good enough *to-day*.

The Hydraulic

is the *only shield* that is mechanically
up-to-date.



SEE the hydraulic pump at either end?
They work like a door check. An easy
downward pressure with *one finger*, and it
falls down; the reverse operation brings it
into use instantly. It works smoothly,
without a jar or a jolt; and you need not
fear a clatter of broken glass if you keep
the pumps filled with oil.

41-inch size, \$35.00 44-inch size, \$37.50
Either in 25-inch or 29-inch heights.

Above prices include all fittings and either Mahogany
or Walnut filling-in boards, in 6, 9 or 12-inch heights.

Send for Catalog "A"

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Manufacturer

232 West 58th Street, NEW YORK

CHICAGO BRANCH
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HESS BRIGHT

YOU cannot afford to take
chances with the bearings
you put on your car; if you
do, the chances are largely in
favor of your ultimate disap-
pointment and chagrin. Don't
take these chances—you don't
have to—just equip your cars
with the world-famous

Hess-Bright Ball Bearings

and be sure. HESS-BRIGHT BALL
BEARINGS are used on most of the
good cars made here and abroad. They
should be used on all cars, and will be
eventually. There's no good reason
why you shouldn't use them and no
end of reasons why you should. The
prime reason is that they are absolutely
right; they are a development of years
of intelligent effort, regardless of
expense, directed along the line of
producing the very best possible ball
bearings that could be made. This
means that the material from which
the balls and bearings are made has had
special making to meet the exacting
requirements of such a bearing. It
means that the balls are absolutely
true, that they are hard, that the
grooves in which the balls run are
so made as to allow the balls to run
smoothly and easily without slack; it
means that a HESS-BRIGHT BALL
BEARING will last and maintain its
efficiency and that they are the only
bearings you can afford to use on your
cars whether the cars are high-priced
or low. A treatise on Ball Bearings
is sent on request. It will interest
you. Write for it today.

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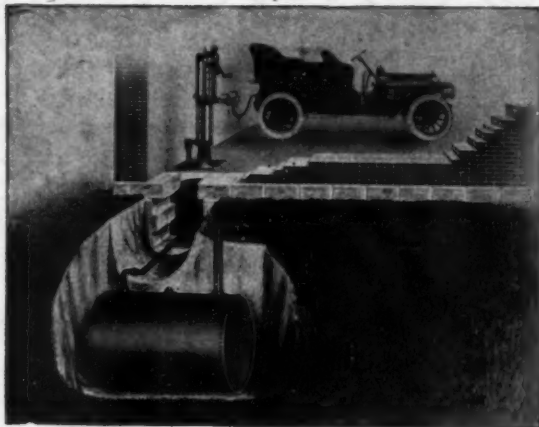
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THE BOWSER

**Long Distance Gasolene Storage
Outfit for Automobile and
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SAFETY, ECONOMY and CONVENIENCE

Are among the many advantages embodied in the Bowser Gasolene Storage Equipment.

The Bowser System for Gasolene Storage is beyond question of a doubt the only practical method for storing gasolene.

The outfit saves its cost in one season by providing for purchases at quantity prices. It saves more by preventing evaporation. It protects life and property from fire and explosion.

The Bowser System provides a convenient and easy method for filling your car.

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**Don't
Tear Down
Your Engine!**

An engine torn to pieces and scraped is seldom as good as before.

Prest-O-Carbon Remover chemically dissolves and removes every particle of carbon from cylinders, pistons, piston rings and valves.

For Auto, Marine and Stationary Engines

Cannot injure the metal; cleans one cylinder perfectly in an hour for 25 cents or less. Increases compression, power and durability. Does a better job than scraping. Simply apply with an oil gun.

We Will Refund Your Money if Prest-O-Carbon Remover doesn't do all we claim for it. Price: Gallon, \$3.75; Half Gallon, \$2.00; Quart, \$1.00. Beware of imitations containing kerosene or strong acids. If your dealer does not supply you promptly, send your order to us, to be shipped from our nearest office.

The Prest-O-Lite Co. 234 East South St.
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Branches at New York, Boston, Philadelphia, San Francisco
and Toronto
Makers of Prest-O-Lite Gas Tanks.



**Any Old
Tank**

will hold gasolene above ground. A riveted tank of the tin can variety can be made air-tight by soldering it, and provided there is no pressure on it, it may remain air-tight. But put that tank underground and how long will it remain tight? The weight of the earth will bulge it out of shape, starting the solder around the rivets, which means leakage.

AIR-TIGHT STEEL TANKS
for Automobiles, Motor Boats, etc.
Placed Underground

are made of high-grade steel, 3-16 in. thick, brazed, without rivet or solder joint to leak, by a process we have successfully used in the manufacture of tanks for the largest railroad systems in the world for 20 years.

AIR-TIGHT STEEL TANKS
are sold on 30 days' trial with an absolute money back guarantee. Write for Illustrated Booklet, FREE.

The Air-Tight Steel Tank Co.
400 WOOD STREET
PITTSBURGH, PA., U.S.A.



THE MASTER MAGNETO

MASTER—"One who has attained eminence in his art."

Herr Unterberg for years designed and constructed the best known magnetos of the day, but sold under other names. What more natural than that he should place in the magneto now sold under his own name the result of all of his previous experience? **RESULT:**—In the dual type—**THE MASTER INTERRUPTER**, non-adjustable, indestructible and fool-proof—40,000 miles of use show no wear. The location of the **MASTER BATTERY TIMER** in the **MAGNETO** and **THE MASTER DISTRIBUTOR**, the insulation of which cannot be burned by high tension, sparks when the motor is started on the battery switch.

THE NEW U. & H. MASTER MAGNETO catalog illustrates and describes in detail these most important up-to-date magneto improvements.

J.S. BRETZ COMPANY
Sole Importers, Times Bldg., New York.



You Can Go **WHERE** You Like and Come Home
WHEN You Like if your car is equipped with a

K-W MAGNETO

Just think of having a small, compact electric power plant on your car which will **always** furnish you with electric power for Ignition, which cannot get out of order, break down or deteriorate, and which will in addition to furnishing a **perfect** ignition give you

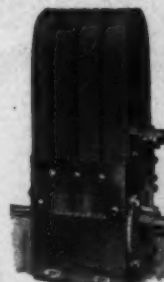
POWERFUL ELECTRIC SEARCHLIGHTS

Figure out for yourself what your battery current cost you last season—then figure out what your lighting bill was if you used Acetylene or Gas Tank—add to it the annoyance and trouble you had with both and then ask yourself if you can afford to be without the K-W Magneto when it costs only

\$35.00

and is **ABSOLUTELY GUARANTEED** to fulfil every claim we make for it. No dry cells or storage battery for your ignition. No acetylene or gas tank for your lights. The K-W Magneto is

A COMPLETE LIGHTING AND POWER PLANT IN ONE



MODEL A
Belt Drive Jump Spark. Most simple and efficient magneto made.
Price, \$35.00

THE NEW K-W SPARK COIL

stands as high among coils as the K-W Magneto does in its class. The K-W Spark Coil is the only Spark Coil made from which **every drop of water and moisture has been removed.**

The K-W Spark Coil is an anhydrous coil, with a quick time constant. Has **extremely fast Hammer Break Vibrator** and gives a spark **many times hotter** than that produced by any other coil.

Contact points are of "Platino-Iridium," an alloy having a value twice that of gold. Cannot "freeze" or "stick together" as ordinary "platinum" points do.

The K-W Spark Coil will not short-circuit and cannot be broken down.

The K-W Spark Coil is also made in a Synchronized Coil, having an extra unit or Master Vibrator. This extra unit can be furnished with the K-W Spark Coil or not as may be desired.

Write for prices and booklet to-day. K-W Ignition leads the world.

THE K-W IGNITION COMPANY, 34 Power Ave., Cleveland, Ohio, U. S. A.

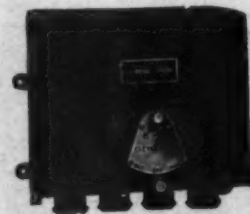
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Four-cylinder Coil and Switch

Price, \$30.00

Other prices on application

New Departure Bearings Stood the Test

Remarkable Demonstration of Combined Thrust and Radial Load Capacity



This cut shows the Allen-Kingston car taking the very bad right-angular curve at Sport Hill Climb, Bridgeport. The car travelled at a speed of 50 miles an hour and photograph shows the skidding of the rear wheels just before righting for the finish and winning its class event.

The car is mounted on NEW DEPARTURE "TWO-IN-ONE" ANNULAR BALL BEARINGS, demonstrating beyond the possibility of a doubt the ability of the New Departure bearing to take end thrust in wheels on high speed cars.

The bearings in the wheels of two other cars went down on this turn.

CATALOG—TREATISE ON REQUEST

The New Departure Mfg. Co., Bristol, Conn.

THE POWERFUL



Grout

**PRICE
WITH FULL
EQUIPMENT
\$2,500**

**The Car for style,
power,
speed and wear**

Grout cars have withstood every test—reliability, hill-climb, endurance contest—and have shown the greatest ease of running, with least attention, mile after mile, of any standard car made. It's worth the trouble to find out all about the "Grout," even though you don't buy—we will cheerfully send full information on request.

GROUT AUTOMOBILE COMPANY, Orange, Mass.

AGENTS WANTED IN UNOCCUPIED TERRITORY—WRITE US.

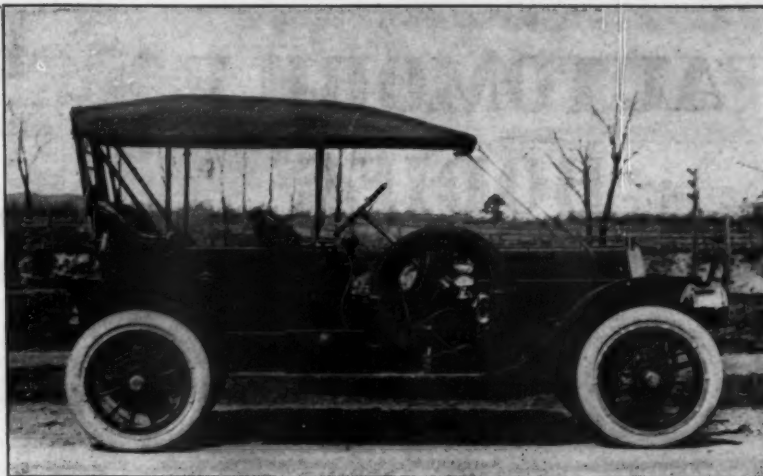
Knox

STOCK CARS

—AT—
CLEVELAND, OHIO, Hill Climb
 on Porter Hill, June 9, 1909

Knox Cars **WIN** every event entered

FOUR FIRSTS including:
 FIRST in \$2,000 to \$3,000 Class.
 FIRST in over 2,204 lbs. stock cars.



Knox 1910 Tonneauette

FIRST in piston displacement handicap.
 FIRST in FREE-FOR-ALL.
 Record of the Hill for Standing Start.

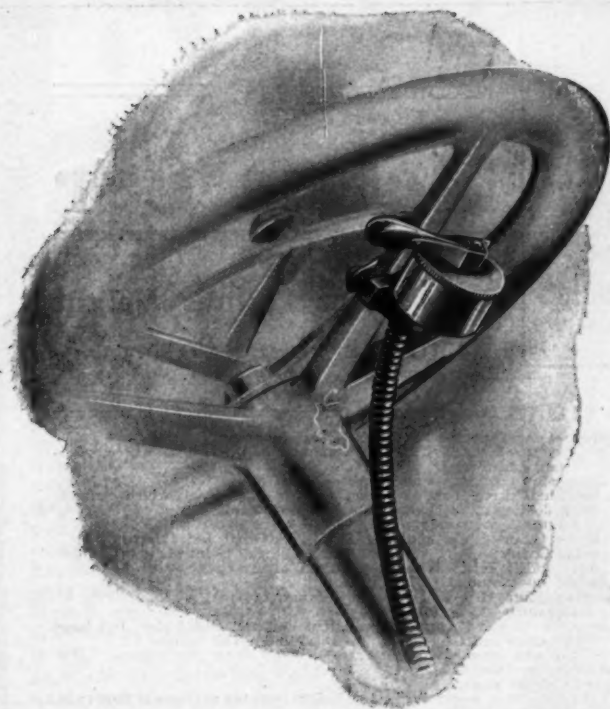
The persistency of Knox stock cars to win contests in competition with all makes is conclusive proof of the advanced ideas of construction.

Knox cylinder construction made with detachable heads, valves in the head, unit power plant, three point suspension, straight line shaft drive, a perfect lubricating system, and the use of the best material and skilled labor, coupled with years of experience building nothing but high-grade cars, are good reasons for their unapproachable record of success.

These undisputed facts, coupled with strictly up-to-date designs, quietness, easy riding qualities and the complete equipment of Knox cars, including Fisk demountable rims and tires, places them far in advance of all competition.

Write for 1910 Advance Information

KNOX AUTOMOBILE CO., Member **Springfield, Mass.**
 A. L. A. M.



The
 New

CONNECTICUT

Steering Wheel Switch

Control your Battery or Magneto
 from the Steering Wheel

The Connecticut Steering Wheel Switch is absolutely necessary. It should be part equipment of every car. It gives you control of your ignition right under your thumb—right where it ought to be—whether you are running on Battery, Magneto or both. With a dual system the Coil and Magneto can each be operated independently or both together.

CONNECTICUT IGNITION DEPT.
UNITED MANUFACTURERS, INC.

Broadway and 76th Street, New York

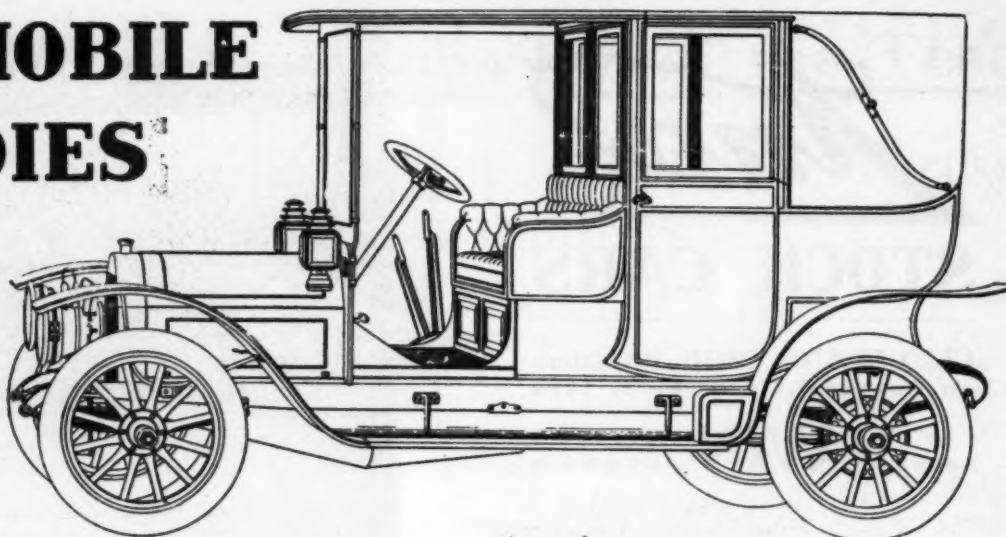
BRANCHES

CHICAGO—1421 Michigan Ave. CLEVELAND—1932 Euclid Ave.
 PHILADELPHIA—422 Commerce St. DETROIT—225 Jefferson Ave.
 BOSTON—109 Massachusetts Ave.
 SAN FRANCISCO, CAL.—Hughson & Merton, 544 Van Ness Ave.

Price \$5.00

We suggest that you write for Bulletin No 50-B

AUTOMOBILE BODIES



For more than seventy years we have been building coach work of dependable quality. We are now engaged in building bodies for motor carriages and are now prepared to do so in a prompt and efficient manner.

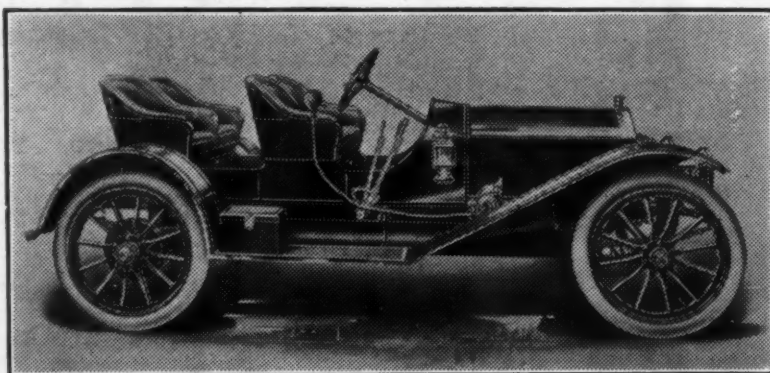
THE QUALITY will be the same as has enabled us to build up the largest coach business in America, and our prices will be most reasonable because we have the capital and facilities to do this kind of work at less cost than many, not equipped so favorably.

Let us show you designs.

JAMES CUNNINGHAM, SON & CO.

ROCHESTER, N. Y.

557 Wabash Ave., CHICAGO, ILL.



The McCue Car

Sixty-Seven Pounds Weight
to the Horse Power

SPECIFICATIONS

BODY—Aluminum and Wood Panel.
SEATS—Four persons.
WHEEL BASE—118 inches.
TRACK—56 inches.
TIRES—36 in. x 4 in., front and rear.
FRONT AXLE—I-Beam Section, large ball bearings in hubs and head of steering knuckle.
REAR AXLE—Floating Type, ball bearing throughout.
SPRINGS—Semi-Elliptic.
BRAKES—Foot Brake 14 in. expanding; emergency brake 10 in. expanding, fitted with fire-proof lining, brake shafts extending under car.
FRAME—Cold Rolled Pressed Steel, Channel Section.
MOTOR—Model R, 4-Cylinder, 4-Cycle, 4½ in. x 4½ in. Rated 29 H.P., actually develops 36 H.P.
IGNITION—Jump Spark, double system.
CURRENT SUPPLY—Bosch Magneto also Connecticut Coil and Battery to separate spark plugs.
LUBRICATION—Self-contained oiling system, circulation by splash and pump, gear driven.
MOTOR CONTROL—Quadrant with Spark and Throttle Levers on top of wheel.

CLUTCH—Cone Type, leather faced. Gettable Springs.
TRANSMISSION—Selective Type, with annular ball bearings. Three speeds forward and reverse.
TRANSMISSION CONTROL—Side Lever.
DRIVE—Shaft drive to bevel pinion gears in differential, which connect with floating axles having hub clutches integral.
GEAR RATIO—3 to 1 or 3½ to 1.
STEERING GEAR—Right and Left Hand. External and Internal Nut.
STEERING COLUMN—2 in., set at 30 degrees, having 16-in. wheel with quadrant and levers for Motor control.
CARBURETOR—Automatic Float Feed.
GASOLINE FEED—Gravity Exhaust pressure optional.
TANK CAPACITY—15 gallons.
EQUIPMENT—Bosch Magneto, Connecticut Coil and Distributor, two large Gas Lamps and Generator Two Dash and a Tail Lamp.
TOP—Top and other equipment extra.
FINISH—Color Dark Blue.
WEIGHT—2,080 pounds.
CLEARANCE—12 in. under flywheel. Height from top to frame of floor 25 in.
PRICE—Finished, \$2,250.
OPTION—Same Car with Model G 4½ in. x 5 in. 45 H.P. Motor, \$2,550.

CATALOGUE UPON APPLICATION

The McCue Company, Hartford, Conn.

NORTH AMERICAN MOTORS

Large capacity—complete equipment. 4 and 6 Cylinders. 4x4½" and 5x5½"
For Truck, Automobile and Taxicab Service.

Built with an intimate knowledge of work they have to perform.

Integral oiling system, oil tank only on the frame.

Fan fly wheel and self contained clutch without end thrust.

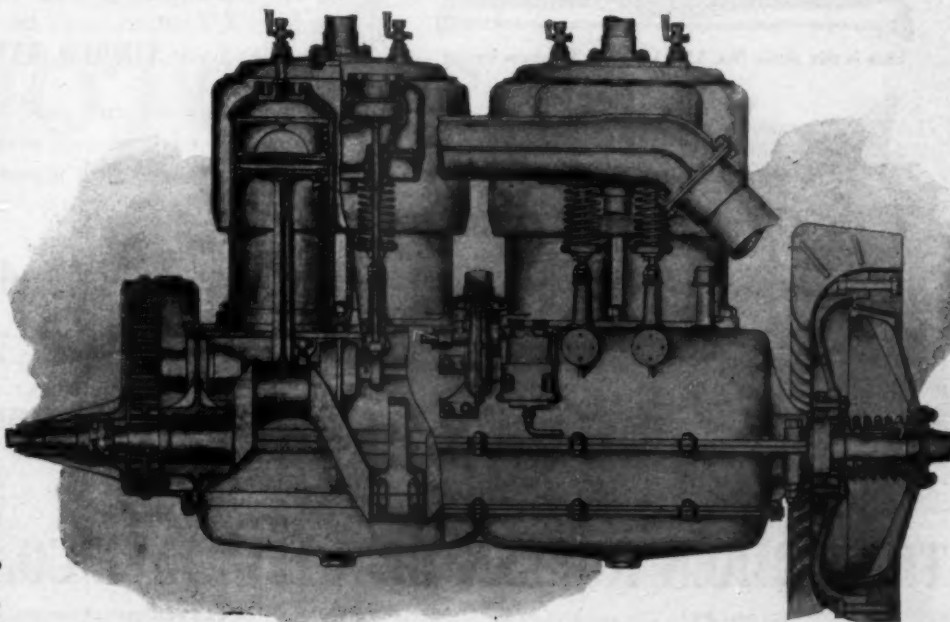
Side thrust on valve tappet and stem eliminated.

We believe our motors show the greatest detail refinement of any make of motor on the market.

Catalogue on Request

North American Motor Corporation

77 Broad Street, Stapleton,
 Borough of Richmond,
 NEW YORK CITY

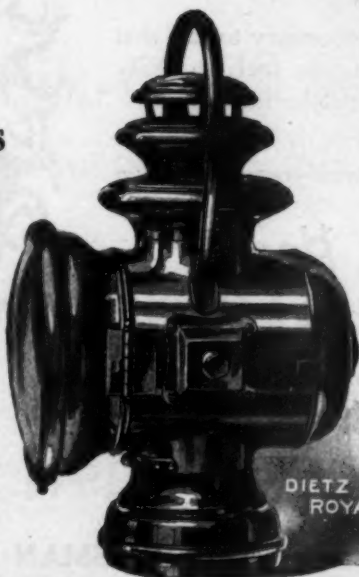


"DIETZ" LAMPS

"DIETZ"

"Royal" Side Lamps

BEAUTIFULLY MODELED lamps of 65 candle power, 14½" high, for kerosene. As in all other Dietz Lamps, great care is taken to have smooth, rounded surfaces and as few projections as possible that they may be easily kept clean, and present most graceful lines. These lamps are equipped with No. 1 "Royal" long cone burners, with ⅝" wick, regulated by knurled button under fount; removable silvered Reflectors; ruby rear signals, and a Combination Socket to take flat or round brackets. Door lens is 6⅞" diameter, and so constructed as to afford a spreading light of great intensity.



DIETZ
ROYAL

QUALITY

Style—Efficiency

CAN BE FITTED FOR ACETYLENE OR ELECTRIC BURNERS on order. Made regularly in polished brass, but also furnished in gun metal finish. For use on big, high-class cars and for those who, while desiring style and elegance, want reliability and efficiency in lighting. We invite correspondence with anyone interested. Write to us. A letter carries no obligation to go further, and may result in your getting next to the one thing that will perfect your lighting equipment.

**DIETZ
MOTOR CAR
LAMPS**

R. E. DIETZ COMPANY, Manufacturers, 60 Lighthouse St., New York, U.S.A.

ESTABLISHED 1840

PIONEERS IN THE MOTOR LAMP INDUSTRY

1909 CATALOGUE ON REQUEST

GAS—OIL—ELECTRICITY

A WIDE VARIETY OF CHOICE

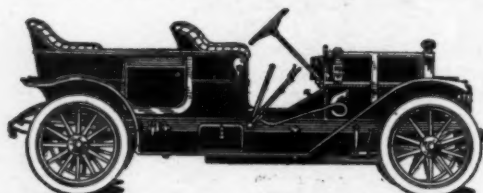
**DIETZ
MOTOR CAR
LAMPS**

PLEASE MENTION THE AUTOMOBILE WHEN WRITING TO ADVERTISERS

A \$60,000 INSURANCE POLICY



This is the Axle No. 124 I-Beam Timken Front



This is the car—Velie No. 30 Touring Car



This is the Axle No. 525 Timken Rear

seems a large policy for a manufacturer to carry on each and every car he turns out. Yet, the wisdom of the manufacturer who paid \$60,000 more for axles for his 1909 output, can't be questioned when you know the axles were **TIMKEN AXLES**.

The extra amount paid by this manufacturer was in no wise an expense—it was more than an investment, it was insurance and investment both. That is really the reason why

Timken Axles and Roller Bearings

are in use on over **70%** of all the high grade automobiles and **90%** of the trucks built in this country. If you knew as much about **TIMKEN AXLES** and **ROLLER BEARINGS** as *The Velie Motor Car Co.* does, you too, would pay the difference. We will be glad to tell you.

THE TIMKEN ROLLER BEARING AXLE CO., Canton, Ohio

BRANCHES: 10 East 31st Street, New York City. 429 Wabash Avenue, Chicago, Ill.

I Will Keep Down That Up-Keep Expense!

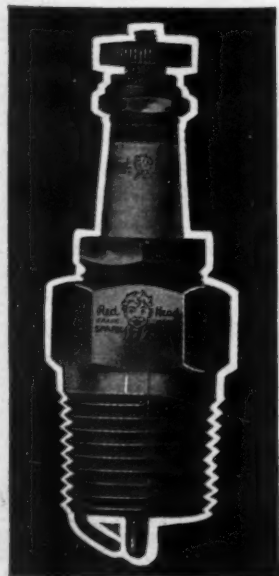
MY cheery smile makes it almost unnecessary to say that the luxuries you love or the things you feel necessary adjuncts to modern motoring will not be lacking.

My suggestion is—
Send, 'phone or wire your dealer for a

Red Head

Spark Plug and let me do your sparking. I've been cut out to do this kind of work **efficiently, energetically and economically**. All sizes and styles,

\$1.00



Write for booklet "A"

EMIL GROSSMAN COMPANY

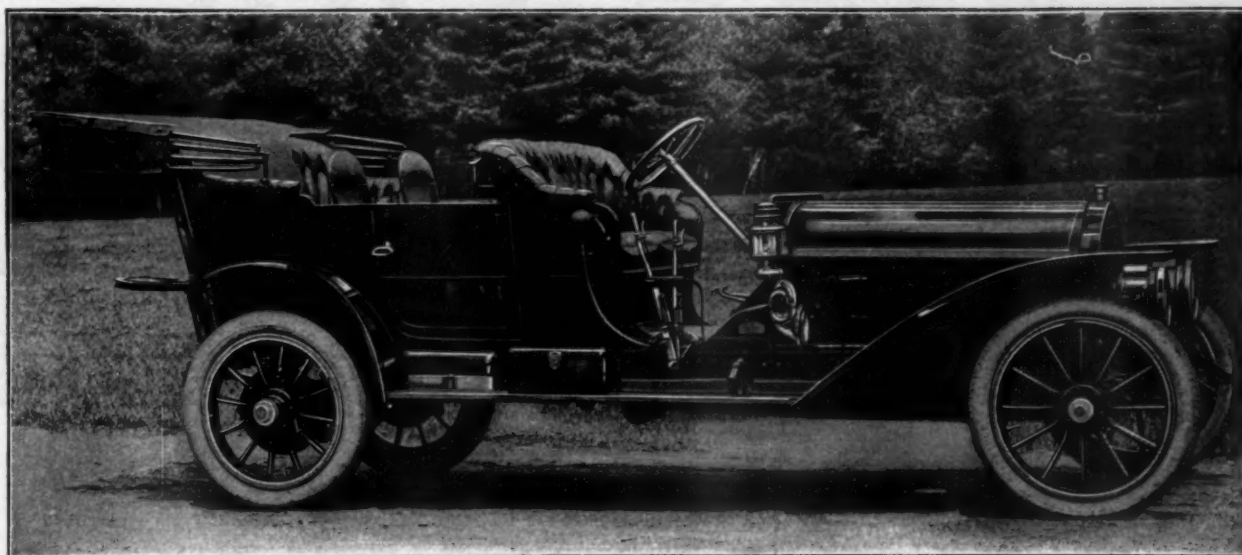
Manufacturer

232 West 58th Street, NEW YORK

CHICAGO BRANCH
1436 Michigan Ave.

DETROIT BRANCH
650 Woodward Ave.

STEVENS-DURYEA MOTOR CARS 1910



Model Y Six-Cylinder Forty H.P.

Over four years consistent Six-Cylinder Successes

STEVENS-DURYEA CO.

900 Main Street

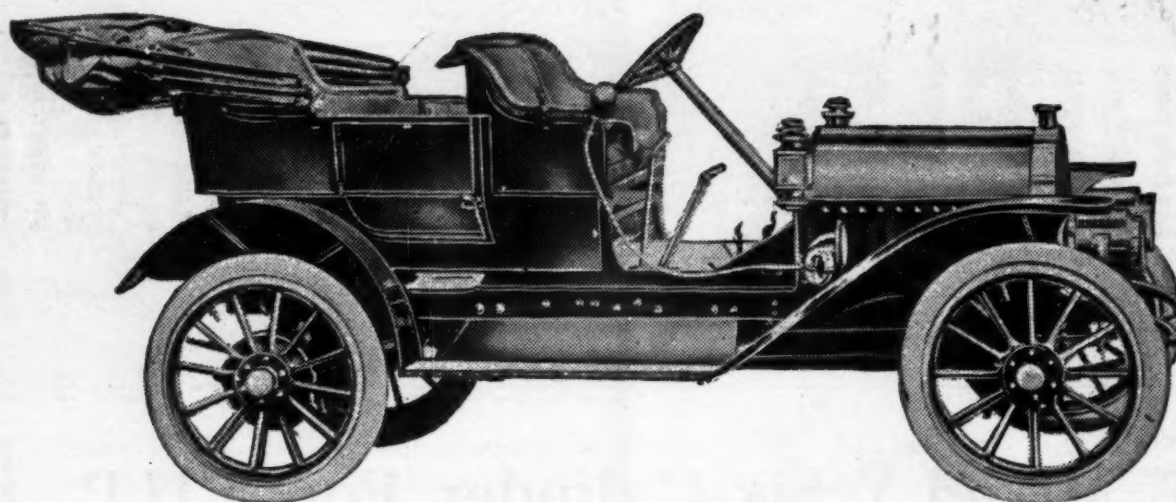
CHICOPEE FALLS, MASS.

Members Association Licensed Automobile Manufacturers

The Autocar

1910 TYPE XX

\$1750.00



TYPE XX, 1910, 25.6 H. P. AUTOCAR, \$1750

Four Cylinders, 4" x 4 1-2". I Beam Front Axle. Semi-Floating Rear Axle.
Bosch Magneto—Dual System. 34" Wheels. Five Lamps and Generator.
Universal Rims. Adjustable Taper Roller Bearings Throughout.

We have good territory open for dealers

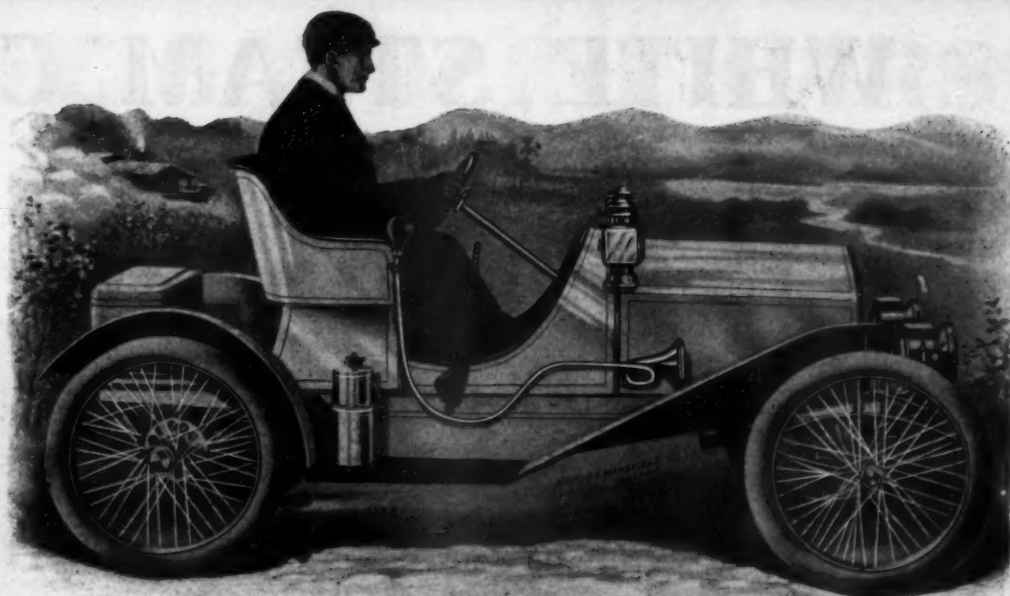
Write for catalogue and information

THE AUTOCAR COMPANY, Ardmore, Pa.

40 MILES

to the
GALLON
in a
METZ
CAR

equipped
with 1 inch



SCHEBLER CARBURETER

"The Standard of the World"

"The Heart of the Automobile"

This remarkable record made by Mr. C. H. Metz driving a METZ CAR is FURTHER PROOF OF "SCHEBLER" CARBURETER EFFICIENCY—a performance of fact and worth more than a bushel of theories. And there's no end of FACTS and PROOFS of "Schebler" Carbureters supremacy. The fact that there are over half a million satisfied users to-day—the fact that many makers of automobiles who formerly made their own carbureters have abandoned their manufacture and adopted "Schebler"—the fact that the leading automobile makers of America use "Schebler" Carbureter exclusively—and the fact that most of the endurance runs, speed contests, hill climbs, etc., held in this country are won by cars equipped with "Schebler" Carbureter, all go to proclaim "Schebler" efficiency and reliability.

If you want the best results and the elimination of carbureter troubles get the BEST carbureter — the "Schebler"

WHEELER & SCHEBLER, MANUFACTURERS Indianapolis, Ind.

Sales Offices: Factory Sales Corporation, 1438 Michigan Ave., Chicago.

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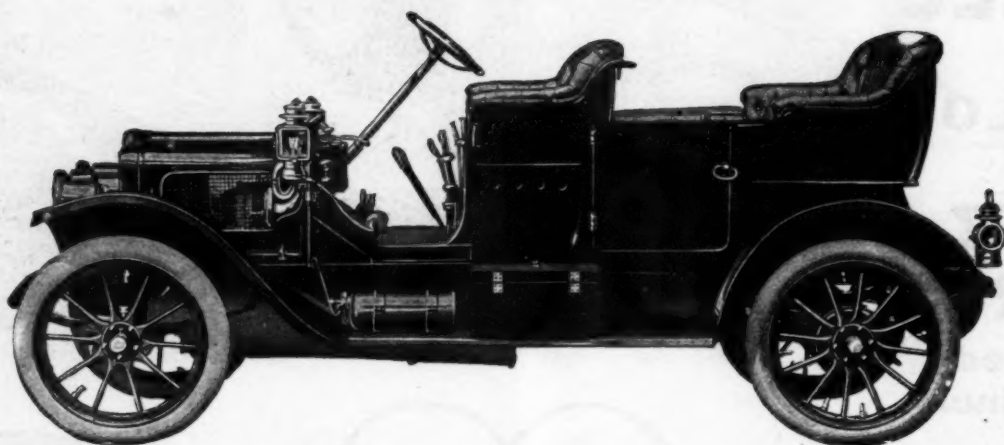
Eastern Office: E. J. Edmond, Mgr., The Motor Mart, 624 and Broadway, N. Y.

Canadian Office: Canadian-Fairbanks Co., Distributors for Dominion of Canada; General Office, Montreal.

For Sale by Any Reliable Dealer in Automobile and Marine Engine Supplies

WHITE STEAM CARS

FOR 1910



The White Steam Cars for 1910 will be made in two models—one of 40 horse-power, known as the Model "M-M" and selling at \$4000 and the other of 20 horse-power, shown above, known as the Model "O-O" and selling at \$2000. The new cars will closely resemble the Model "M" and the Model "O," respectively, of the past season.

The most important feature of the new models is that either kerosene or gasoline may be used as fuel. The necessary adjustments to a car so that the fuel may be changed from gasoline to kerosene, or vice versa, may be made in a few minutes. So completely have we solved the kerosene problem, that when a car is in operation it is practically impossible for any one to tell whether kerosene or gasoline is being used. By using kerosene, the drivers of White cars will enjoy the advantages of a very cheap fuel, which can be handled with impunity and which can be procured at every cross-roads store and at almost every farm-house.

The other new features comprise: a lengthening of the wheelbase of the 20 horse-power car to 110 inches, a pressed-steel frame and a further tilting of the steering post in the 40 horse-power car, and a slight modification of the design of the engine in both models, whereby the water pumps are driven from an eccentric located outside of the crankcase at the rear of the engine.

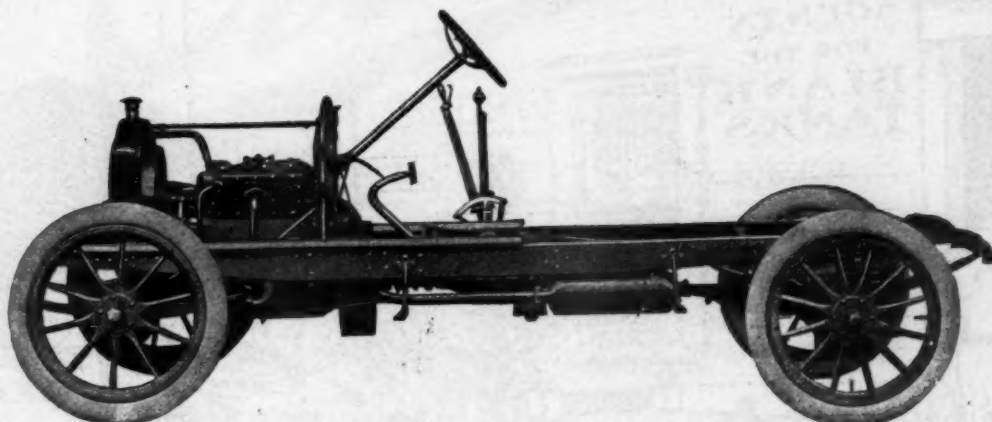
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THE WHITE COMPANY
CLEVELAND
OHIO

New York City, Broadway at 62d St.
Boston, 320 Newbury St.
Philadelphia, 629-33 N. Broad St.
Pittsburg, 138-148 Beatty St.

Cleveland, 407 Rockwell Ave.
Atlanta, 120-122 Marietta St.
Chicago, 240 Michigan Ave.
San Francisco, Market St. at Van Ness Ave.

WHITE GASOLINE CARS FOR 1910



With the addition of a gasoline car to the White products, our extensive selling organization is in a position to meet the demands for all classes of cars. With our unequalled factory facilities, long experience in automobile building and thoroughly trained organization, unencumbered by any pre-conceived notions for or against any particular construction, we are in a position to furnish the best in gasoline car design, workmanship and material.

The White gasoline car is fitted with a four-cylinder, four-cycle engine of extremely simple and neat design. The car has a four-speed selective type transmission with direct drive on the third gear. The four cylinders are cast in one piece. The cylinder dimensions are 3 3/4 inch bore and 5 1/8 inch stroke. The crank-shaft has but two main bearings, which are annular ball-bearings of generous dimensions.

A feature of the car is the unusually small amount of piping and fittings under the bonnet. The valves are all on one side and are actuated by a single half-time shaft. The valve springs are not exposed to view but may be inspected or replaced by removing a side-plate. The above illustration of the chassis of the White gasoline car shows the left-hand side of the engine, on which side are located the valves, the spark plugs, the pipe leading from the centrifugal water pump to the water jacket, the gas intake pipe leading from the carburetor and the exhaust pipe. There is no piping on the right side of the engine, the only device on this side being the gear-driven Bosch magneto to which the timer is attached.

Every detail of the car is in accordance with the most advanced foreign practice and its many desirable features, not found on other American machines, ensure that it will be the popular medium-priced car of the year. It will be made in two types, differing in details of running gear and of body construction, but with identical power-plants. The prices of these two types will be \$2000 and \$2500 respectively.

WRITE FOR DESCRIPTIVE CIRCULAR

THE WHITE COMPANY
CLEVELAND
OHIO

New York City, Broadway at 62d St.
Boston, 320 Newbury St.
Philadelphia, 629-33 N. Broad St.
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Cleveland, 407 Rockwell Ave.
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ARE YOU INDEPENDENT?

THE FOURTH is near at hand. Probably you are planning a three days' tour—from Saturday to Monday. No doubt your preparation will be thorough; you do not like to mar the pleasure of that once-a-year outing for your family or guests. You will forestall trouble and tune the car in every way you can.

What about the lamps? Is the zest of riding to be spoiled if night falls before you reach your destination? Are you going to start and stop by the clock instead of when you wish?

And the source of gas—Are you depending on scattered exchange stations where you may find a waiting list ahead of you? Or are you still temporizing with the sham generator that came with the car, and praying that luck will save you from the need of trying to use it?

RUSHMORE owners are INDEPENDENT—independent of the sun, independent of exchange stations, free to drive as far and as long as they please. With adequate Rushmore equipment—Headlights, Searchlight and Generator—daylight speeds are both easy and safe, and gas is to be had at negligible cost wherever carbide is sold.

The Rushmore Generator turns on and off like the gas in your house. It does not waste carbide, overheat or play tricks of any kind. It is the most reliable source of gas known.

RUSHMORE DYNAMO WORKS PLAINFIELD, N. J., U.S.A. - LONDON, PARIS, CHICAGO
RUSHMORE

PLEASE MENTION THE AUTOMOBILE WHEN WRITING TO ADVERTISERS

Overland

THIS CAR COSTS LITTLE TO KEEP

It's a car you can afford—capable—plenty of power and speed—yet remarkably economical.

There's no other car carrying as large a load that will go so far in a day on so little gasoline. No other car of the same size so saving of tires.

The first Overland sold has been on the road day-in-and-day-out, summer-and-winter—seen far harder service than you'll probably ever give your car—yet the cost for repairs has been scarcely worth counting; and to-day it's as strong-going, smooth-running, noiseless and easy-riding as any new car.

It is a car you can keep always on the go, all-day-long, day-after-day, without trouble or repair bills—a car always ready and reliable under all conditions, usual or unusual—with plenty of reserve power for hard climbs and heavy roads.

4 Cyl., 30 H.P.

Planetary Trans-Roadster

\$1250

4 Cyl., 30 H.P.

Planetary Trans-5 Passenger Tonneau

\$1400

4 Cyl., 30 H.P.

Selective Trans-Touring Car

\$1500

6 Cyl., 45 H.P.

Selective Trans-Touring Car

\$2250

Choice of bodies in each of these models.

Let us give you the name of the dealer in your territory so you can have a prove-up demonstration.

OVERLAND AUTOMOBILE CO.
INDIANAPOLIS, IND.

STOP!!

Go no further until you have read this offer of

A FREE TRIAL FOR THIRTY DAYS

Simply to prove our faith in the great efficiency and reliability of

THE "STAR" SPEEDOMETER

We ask you to take one and give it a tryout. Put it on your car and try it for registration at the highest speed you dare to go—try it at slow speed—try it for the registry of fractions of a mile—try it for a 10,000-mile run if you can work the 10,000 miles into a month. Forget that we claim the "STAR" to be a better speedometer than any made at prices double or treble our price

—prove us wrong if you can. There's the proposition—take a "STAR" and try it for a month on your own car in your own way. If it doesn't make good send it back to us and we'll return your money without a whimper. In this way you don't have to take our say so that the "STAR" is good—you are to believe only what is demonstrated on your own car right before your eyes, regardless of our claims of "STAR" Speedometer superiority. You can't ask for a fairer proposition than this, can you? Do we get the chance to make good? At least, write to-day for literature; it will greatly interest you.

You'd do well to send to-day and get your speedometer in shape now, for Summer touring.

Star Speedometer Co.

Danville, Penna.

New York, 1755 Broadway Boston, Mass., 222 Eliot St.
Philadelphia, Pa., Geo. W. Nock Co., 126 N. 4th St.

DEALERS: If we can only get your letter of inquiry we know we can present you a proposition to push "STAR" Speedometers that will be mutually agreeable and result in much profit to each of us. You are doing yourself an injustice every day you let this opportunity pass. Write **TO-DAY**.



Do You Belong to the "Maxwell" Family?

MAXWELL owners are a contented lot—for their's is a car to ride in, not to tinker over.

An owner's verdict is the final analysis of the value of an automobile. Since there are 14,600 satisfied MAXWELL owners it would be an easy matter for you to get an unprejudiced opinion.

The tour of the Maxwell Briscoe Motor Club is an indication of the confidence MAXWELL owners place in their cars.

Over 30 MAXWELLS assembled at Columbus Circle on June 14th for a week's tour through the Berkshire Hills of Massachusetts, and over the roads of New York, Connecticut, Pennsylvania and New Jersey—a thousand miles in all.

MAXWELL owners feel the spirit of co-operation extended them by the men who make the MAXWELL.

Why don't you join the MAXWELL Family? Let me send you our catalog and other literature.

Yours very truly,

Benj. Briscoe President

MAXWELLS range in price from \$500 to \$1,750. From 2-cylinder, 10 H.P. runabout to a big 4-cylinder 30 H.P. touring car or roadster. One of our six models will solve your automobile problem.

MAXWELL BRISCOE MOTOR CO.

P. O. Box 103, TARRYTOWN, N. Y.

PAWTUCKET, R. I.

Main Office and Factory

NEW CASTLE, IND.

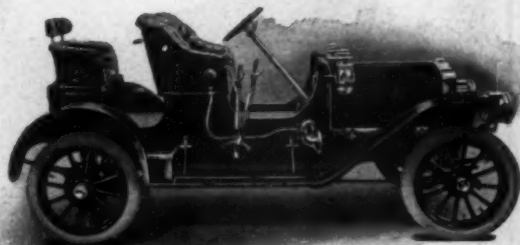


Model A.—2 Cyl. 10 H.P.—\$550

This standard American runabout costs only \$550. It incorporates all the MAXWELL principles that have made these cars famous the world over. Equipped as per illustration with long fenders and running boards, oil lamps, etc.

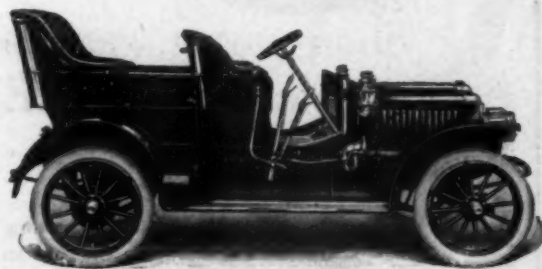
Maxwell Junior, \$500

Equipped with plain mud guards only, oil lights, etc.



Model K. A.—4 Cyl. 30 H.P.—\$1,750

A gentleman's roadster of "class," equipped with gas lamps, generator and magneto. Same chassis as famous 10,000 mile Non Stop car.



Model D. A.—4 Cyl. 30 H.P.—\$1,750

A powerful five-passenger touring car, combining MAXWELL reliability with speed and comfort. Duplicate of the world's record holding 10,000 mile Non-Stop MAXWELL. Equipped with gas lamps, generator and magneto.

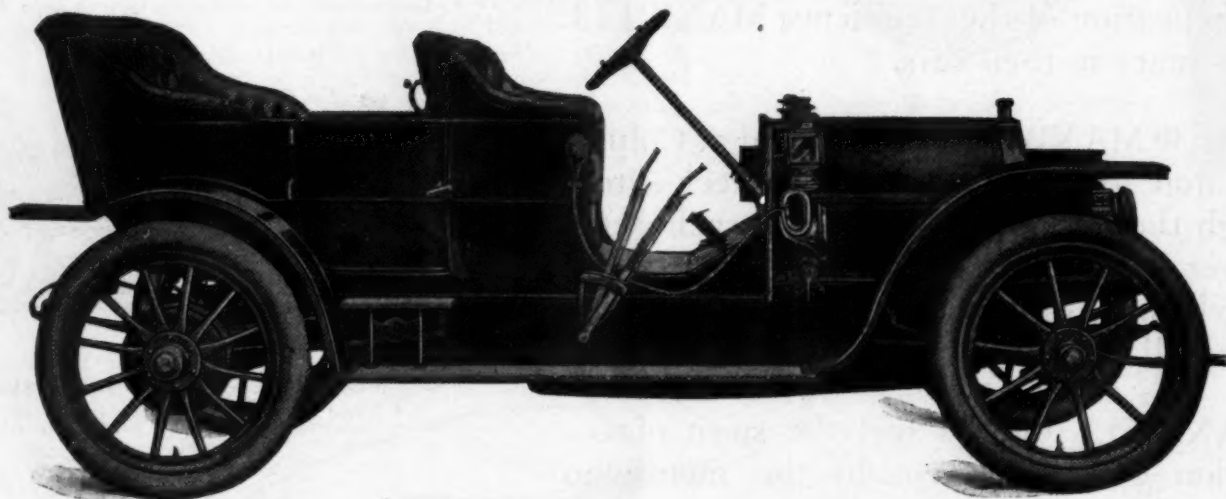
The Car of Real Power

MIDLAND

BUILT RIGHT

LOOKS RIGHT

STAYS RIGHT



Model G 9, Five-Passenger Touring Car

IMMEDIATE DELIVERY

Motor, $4\frac{1}{2} \times 5\frac{1}{2}$, 4 Cylinder
Wheels, 36 x 4
Wheel Base, 118"
Axles, I Beam Front, Full Floating Rear
Lubrication, Pumping Crank Case

Transmission Selective 3-Speed and Reverse
Bearings, Timken
Ignition, Magneto and Battery
Clutch, Disc Cork Inserts
Body, Full Size 5 Passenger

MIDLAND MOTOR COMPANY

FACTORY AND OFFICE: MOLINE, ILL.

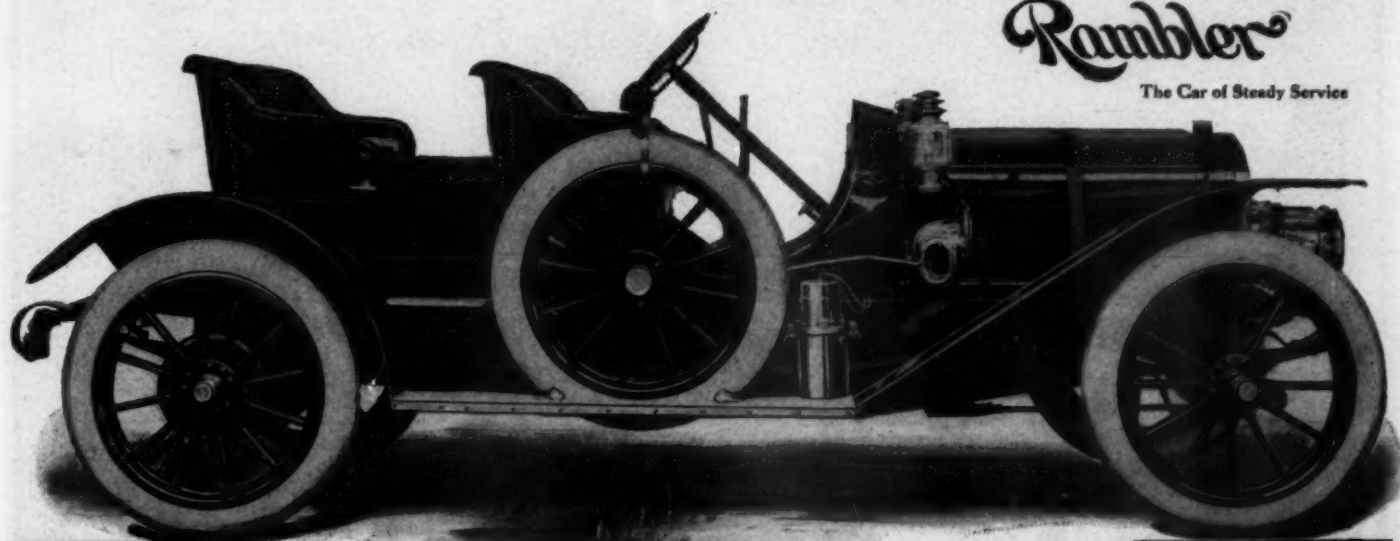
NEW YORK CITY—Midland N. Y. Co., 1783 Broadway
PATERSON, N. J.—E. K. Conover, 675 East 23d Street
PHILADELPHIA, PA.—Stoyle Vogel Auto Co., Broad and
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BOSTON, MASS.—N. E. Motor Sales Co., 364 Columbus Ave.
MINNEAPOLIS, MINN.—Haynes Motor Car Co.

OMAHA, NEB.—Freeland Brothers & Ashley
STERLING, ILL.—Sterling Motor Company
CLEVELAND, O.—Wingle Motor Car Company
CHICAGO, ILL.—Kramer Motor Car Co., Evanston and Sheri-
dan Streets

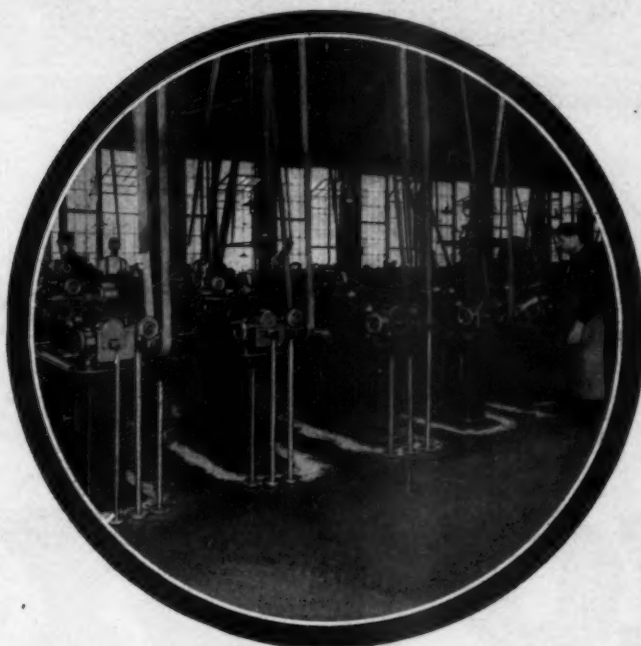
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Rambler

The Car of Steady Service



Model Forty-five, Four-Passenger Car, \$2,500.
With Lamps and Tools only.



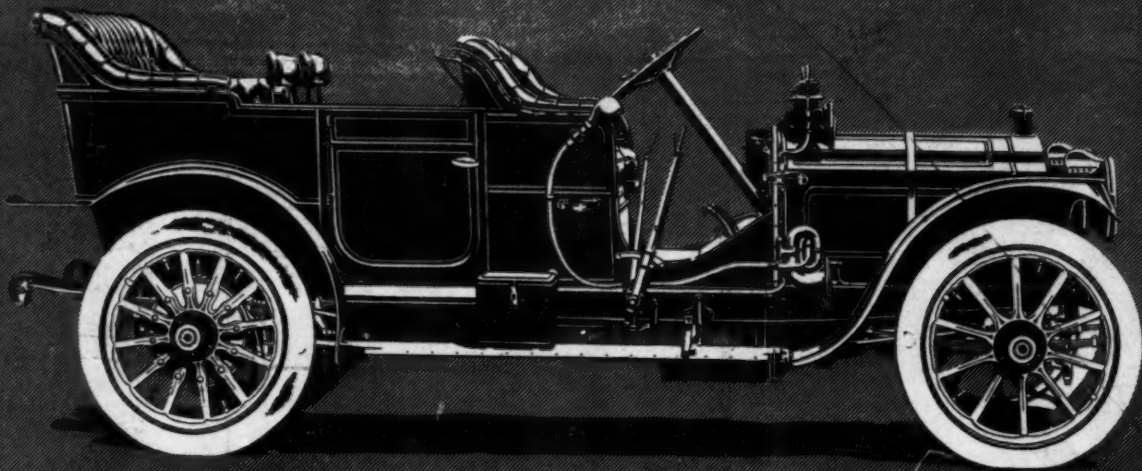
Automatic
gear-cutters,
Rambler Factory.

The application of automatic machinery throughout the Rambler Factory not only makes absolute accuracy and interchangeability of parts certain, but insures the most perfect product that skilled workmen, aided by complete factory equipment, can produce.

Representatives in
all leading cities.

Thomas B. Jeffery & Company, Main Office and Factory, Kenosha, Wis.
Branches and Distributing Agencies: - Chicago, Milwaukee, Boston, Cleveland, New York, San Francisco.

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Packard

MOTOR CARS

1910



Packard Motor Car Company

Detroit, Michigan



Take with you on
your Summer Tours
"The World's Great-
est Lubricant" and
rest care-free from
Lubrication Troubles

KEYSTONE GREASE

Can always be depended upon
to give perfect satisfaction

Sold at Auto Supply Stores and Garages or direct from

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BOSTON
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NEW ORLEANS
610-612 Chartres Bldg.

Atwood-Castle Co.

Quality Lamps

We have never, in all of our experience of thirty-five years in lamp making, found it desirable or business-like to make cheap, flimsy lamps to meet competition in price. The watchword has been *quality* regardless of price, but always under most favorable manufacturing conditions for cheapening cost. No material has ever been too high priced to be of use if it would enhance the quality of our output; no skimping has been done to save a few cents and endanger this quality; no workmanship deviating in the least from the very best has ever been allowed.

Every Atwood-Castle Lamp that has gone forth from our factory has been as good a lamp as the best brains, capital, facilities and experience can make it.

This strict adherence to *quality* has been the means of making us a reputation as lamp builders held by no other lamp-making concern on earth. We're proud of our line of lamps—*there are none better*. We say this without qualification of any kind. For whatever purpose you may need a lamp on your car, there is an ATWOOD-CASTLE Lamp to fill the need, and it will fill the need better than any other lamp of any kind made by anyone.

ATWOOD-CASTLE CO.
Amesbury, Mass.

WESTERN OFFICE:
247 Jefferson Avenue
Detroit, Mich.

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